

MARINE REVIEW.

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Plain Statement of Facts from General Hyde.

Alike to everybody who witnessed the crowning feature of England's jubilee year, the naval review at Spithead, General T. W. Hyde of the Bath Iron Works returns home with impressions of the colossal power of Britain's shipping interests. But he joins other friends of the American ship who are encouraged by the attitude of the present administration at Washington, when he says that "gleams of light are shining through the pall that strangely has fallen over American public opinion as to the need of naval power." A description of the naval review by Gen. Hyde in one of the Bath papers is very interesting. He concludes it with the following plain statement of fact:

"When we apply arithmetic instead of self-congratulation and a boastful spirit to naval affairs, our own weakness, even after ten years of the growth of a new navy, is painfully apparent. We should not deceive ourselves. In this matter we can not deceive anyone else. Of the three classes of ships that, judging from present appearances, will decide future actions at sea, battleships, destroyers, and torpedo-boats, England has built and is building sixty-six battleships, the United States eleven; England some ninety-two destroyers, we have one, building; England has some two hundred torpedo boats; we have four built and fifteen building. In the first naval engagement most ships not destroyed will have to be docked and repaired. England has seventeen drydocks at Portsmouth alone; we have just sent the Indiana to Halifax to be docked. England has a vast merchant marine to draw sailors from; we had once. The strangest supineness and lack of appreciation of sea power seems at the close of this century to have fallen like a pall over American public opinion. But there are gleams of light. We can not continue much longer to neglect what has in all history made and kept the nations great in wealth, in influence, in power, that is, strength upon the sea. The next congress will doubtless take up the question and upon their wisdom depends our country's future. It would be impossible for an American to fail to be jealous of such vast power and prosperity shown by a nation long our rival, though our kin. Yet we can not but rejoice in the thought that it is England's and not some other's. To one who has seen the British hostility of the war years, and the thin veiled dislike that long after followed, their present friendliness is welcome, but we will not yet forget Bunker Hill, or Yorktown, or New Orleans."

Prosperity Due to Ship Building.

Mr. Charles H. Cramp has also been interviewed upon his return from the Congress of Naval Architects and Marine Engineers in London. "It is a significant fact," Mr. Cramp says, "that all the nations of Europe, with the exception of Russia, are elbowing one another in their great haste to get war vessels built. This desire to get a great number of ships built is extraordinary. England now has forty ships under way, a number almost equal to our whole navy. It is the same with the Japanese. The number of vessels they are now building and planning for will outnumber our entire flotilla. For the past thirty years I have been making trips to England, and in all that time I have never before seen the people so loyal or so patriotic. I have never known the nation to be more prosperous. All classes are contented and happy, for work and money are plentiful. And the paramount cause, the cause par excellence, is the great naval preparations, both on behalf of the nation itself and the work being done by the ship builders for the foreign nations. Thousands of mechanics are thus given steady employment, and \$100,000,000 are distributed through this medium in a single year. Just think of it, and think of the stimulus all this has on the other branches of industry, which depend upon the welfare of the laborer and the mechanic. The British official in foreign lands does not hesitate to do all in his power to send trade home to his countrymen. He is expected to do so, and the more successful he is in securing contracts the better he liked. Their course is in strange contrast with that of this government. Our officials abroad either do not care or do not find it convenient to assist in securing contracts for home firms. It is the fostering care that Great Britain shows for her industries that makes her the mighty nation that she is. We might do well, perhaps, to follow their lead somewhat in this, for until our claims are pushed forward all the time in foreign countries we can not expect to secure their trade."

Lake Freight Matters.

Although the improvement in lake freights, which has been confidently expected every day for two weeks past, is slow of development, there is not a particle of doubt now of profitable rates during the last three months of the season. Within the past ten days sales of iron ore have been quite heavy. The purchases have in fact been largely in excess of the expectations of the ore dealers, and the market has reached a point on some ores where the producers are unwilling to sell at prices that prevailed earlier in the season without first being certain of arrangements regarding lake freights. Sales have been made to furnace men who made extensive purchases early in the year, as well as to those who provided only sparingly for their wants. With assurances of more than an average movement of grain, it would seem that a settlement of the coal strike is now all that is necessary to cause higher freights all along the line, and it is more than probable that the coming week will bring a moderate advance, even under present conditions.

The Review has excellent photographs of lake ships.

Heavy Passenger Traffic.

Probably no steamboat venture ever undertaken on the lakes has been subjected to more adverse criticism than the building of the two Northern line passenger steamers North West and North Land. Their cost was said to be too great to ever permit of a fair return on the investment, and the critics declared also that the season of four months, during which they are in commission, was so short that boats of their kind, confined entirely to passenger traffic, could never be made profitable. According to this line of argument they were to serve simply as "feeders" for the Great Northern Railway, the loss to the steamship company being charged against profit from increased patronage afforded to the railway company. But in line with the general increase in passenger traffic on the lakes, the North West and North Land have enjoyed an immense gain in patronage, and the experience of a couple of seasons has brought the operation of the vessels to a degree of efficiency that is entirely satisfactory to everybody concerned. These ships have been carrying from 750 to 950 passengers on round trips, and on several occasions the management has been obliged to suspend the sale of tickets, in order that the vessels might not be overcrowded and the patrons of the line thus subjected to inconvenience. It was announced on the opening of the present week that all accommodations for Tuesday's and Friday's sailings had been sold, together with a very large portion of accommodations for the following week.

Referring to the success that has attended the operation of these steamers this season, as against considerable trouble with the Belleville water tube boilers in the beginning, a gentleman who is closely connected with their management says: "We have been using of late only twenty to twenty-two boilers of the ship's complement of twenty-eight. The entire difficulty in the past was in getting lake firemen to understand that the only way to fuel the boilers properly was by fueling them sparingly, and not my shoveling coal in as if they were anxious to get rid of the fuel as fast as possible. We have firemen this season who are attempting to at least to do what they are told, and in fueling the furnaces sparingly, with thin fires, we have found that from twenty to twenty-two boilers will make more steam than is necessary in operating the vessels, and the economy resulting from this care is most agreeably surprising to the management. The firemen on the ships this season have said that they consider the work on the North West and North Land "a snap" as compared to the firing of salt water ships, or any other ships with which they have had any experience, and the fact that the very same men who shipped with the company at the opening of the season are still with us, with the exception of probably eight or ten, is assurance of the claim that there is no hardship in working the furnaces of these vessels."

Lake Coal Shipments During 1896.

The chief inspector of mines for Ohio, who conducts at Columbus a bureau devoted to this service, includes in his annual report each year a table giving anthracite and bituminous coal shipments from all ports on Lake Erie. This annual summary of the lake coal trade is not absolutely correct, as the inspector is forced to depend upon collectors of customs for a part of the data, and the customs regulations on the lakes are in some respects unsatisfactory when applied to the collection of statistics. The figures are, however, the best that can be secured, and there is little danger of great discrepancies in them. An advance summary of the table is as follows:

"Shipments of anthracite and bituminous coal from all Lake Erie ports, Buffalo to Toledo inclusive, during the season of 1896, amount in the aggregate to 8,941,327 net tons. Of this 3,175,722 tons anthracite and 5,763,605 was bituminous. The latter includes coal taken on for fuel by steamboats trading to the several Lake Erie ports. By a comparison with the preceding year the bituminous shipments are found to represent an increase of 1,543,692 tons. The footings also indicate a gain in the total shipments of 162,093 tons over 1895, and an increase of 2,072,070 tons when compared with 1894. Of the bituminous coal sent to the lake ports during the year, 4,337,815 tons was from mines in Pennsylvania, 1,267,035 from Ohio, 159,117 from West Virginia and 1,638 from Maryland. These shipments from Pennsylvania represent a gain of 1,755,828 tons, which is equal to 75.2 per cent. of the entire year's shipments, as against 61.1 per cent. during 1895, 65.9 per cent. during 1894 and 49.9 per cent. during 1893. The Ohio fields furnished 1,267,035 tons, which is a loss of 99,679 tons as compared with the preceding year, and a loss of 301,877 tons as compared with 1894. It is also a loss of 861,330 tons when compared with 1893. By reviewing a comparison of the percentages of Ohio coal received at the lake ports during recent years, it is found that during the past year it formed 21.9 per cent. of the entire shipments of bituminous coal, as against 32.3 per cent. in 1895, 28.8 in 1894, 46 in 1893 and 25 in 1892, which indicates that during the past three years the percentage of Ohio coal which originated in Ohio mines has decreased 24 per cent., while the quantity from Pennsylvania has increased 25.3 per cent."

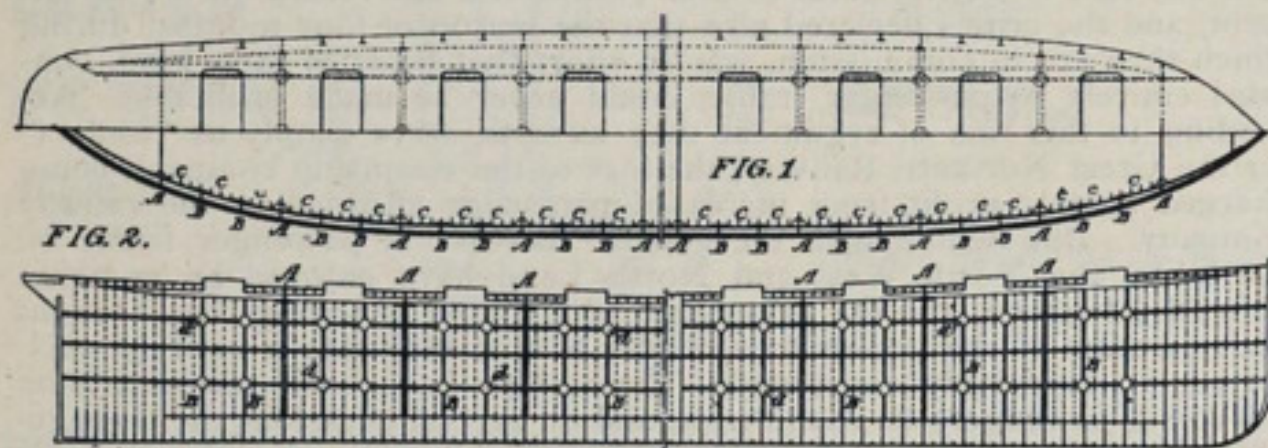
Two vessels were launched at Bath, Me., on Thursday last. Kelley, Spear & Co. launched a four-masted wooden schooner, the Charles G. Endicott, 158 feet keel, 38 feet beam and 18½ feet depth. At the yard of the Bath Iron Works the light-house tender Mayflower was launched. She is a steel steamer, schooner rigged, 164 feet over all, 30 feet beam and 11 feet 10 inches hold.

Inquire of agents of the Nickel Plate road about the two G. A. R. special trains. One leaves Cleveland 1:00 p. m., Aug. 23, and another at 10:00 a. m., Aug. 24. Low encampment rates.

Proposed Improvements in Ship Construction.

In the Review of April 1, 1897, John Haug, naval architect of Philadelphia, who has given considerable attention to the type of freight steamers that are peculiar to the lakes, suggested certain improvements in methods of construction, which, in his opinion, would add strength and rigidity without increasing the weight of material. Mr. Haug has since patented these improvements, and the specifications accompanying his claims will probably prove interesting to both vessel owners and ship builders. He says that the invention relates especially to the construction of vessels intended for carrying cargoes in bulk, such as grain, ore, coal, etc., these vessels being usually constructed with numerous and very wide hatches, in order to facilitate quick handling of the cargo.

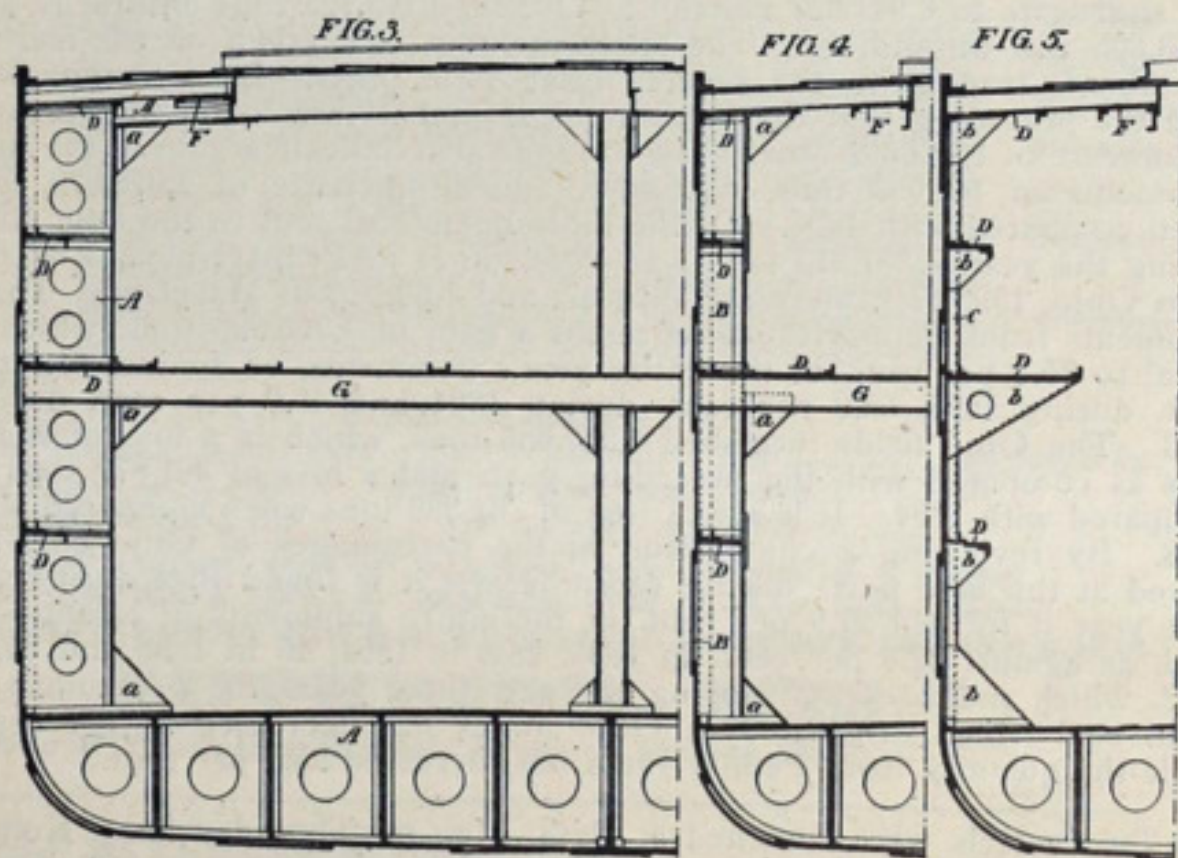
"By reason of the multiplicity and width of these deck hatches," says Mr. Haug, "the vessel is much weakened transversely, especially as in such vessels the usual intermediate decks and most of the intermediate



beams are also omitted, thereby further reducing the transverse strength. Hence there is considerable vibration of the structure when under way, and the general strength and cohesion of the structure is endangered by the insufficiency of transverse connections. In order to overcome these objections, I propose to provide the structure with a series of deep girder-frames disposed at intervals throughout the length of the same, and to further modify the usual construction with the purpose of increasing the general strength and rigidity of the structure. In the accompanying drawings, Fig. 1 represents a view, partly in plan and partly in sectional plan, of a vessel constructed in accordance with my invention, the midship portion of the vessel being removed; Fig. 2 is a longitudinal section of the same; Fig. 3 is a partial transverse section, on a larger scale, showing one of the deep girder-frames; Fig. 4 is a partial transverse section showing certain web-frames which are alternated with the deep girder-frames in the structure, and Fig. 5 is a transverse section through the ordinary framing of the ship. The deep girder-frames A are extended completely around the vessel's section and are spaced at suitable intervals longitudinally. Thus, a deep girder-frame is alternated with each of the hatches, occupying a position midway between the hatches, although this arrangement is simply shown as one instance of a construction embodying my invention, a greater or less number of these deep girder-frames being used, as desired.

"In the construction shown in the drawings the girders of the double bottom constitute the lower members of the deep girder-frames, but in a vessel with an ordinary single floor deep girders will be carried across the vessel from side to side at the bottom in order to complete this member of each frame. Owing to the great strength and rigidity of these deep girder-frames their employment at appropriate points in the structure of the vessel very materially stiffens and strengthens such structure where they are introduced and consequently adds to the general strength of the structure to such an extent as to compensate for the weakness due to the number and width of the hatches employed. In order to further increase the strength of the hull-frame, I alternate with the deep girder-frames web-frames B, of which as many may be used between successive girder-frames as the desired strength of the structure may suggest, two of these web-frames being shown in the present instance between successive girder-frames. The remaining frames C of the vessel are similar to those of ordinary construction.

"Extending longitudinally along each side of the vessel and secured



to all of the frames of the same are a series of longitudinal stringers D, which serve to connect the various vertical members of the framework so as to unite them in a homogeneous structure, provide additional longitudinal strength, and guard against undue local strains, vibration and other sources of weakness. To the under side of the deck frame on each side of the row of hatches I secure longitudinal shelf-plates F, which are also secured to the upper members of the deep girder-frames and serve to longitudinally stiffen this portion of the structure and counteract the

so-called racking strains, which, when the vessel is in a seaway, tend to twist and distort the decks and upperworks of the same. The deep girder-frames may be composed of channel bars or plates stiffened by angles, suitable gussets *a* serving to secure these girders together at the angles and also to the hold-beams G, and the longitudinal stringers D may be secured to the framework of the vessel by similar gusset-plates *b*, while diamond plates *d* serve to secure certain of the longitudinal stringers to the web-frames B."

Mr. Haug's claims, based on the foregoing description of his invention, are as follows: "First, a ship having deep girder-frames extending completely around its transverse section and spaced at intervals longitudinally. Second, a ship having deep girder-frames extending completely around its transverse section at suitable longitudinal intervals, said deep girder-frames being alternated with web-frames and frames of the usual construction spaced intermediately of said deep girder-frames. Third, the combination of the deck-frames with horizontal longitudinal shelf-plates secured to the under sides of said deck-frames and extending along each side of the row of hatches close to the sides of the same.

Iron Trade Prospects.

The conjunction of low prices with improving trade conditions should lead to an enormous increase in the consumption of iron and steel. The times are most propitious for undertaking new enterprises of almost every character. Money is abundant, interest is low, our vast natural resources are again adding to the country's wealth, our workingmen are becoming more generally employed, the farmers are again liberal purchasers of all kinds of manufactured products, and another era of prosperity opens up before us. According to the latest official estimate, the population of this country exceeds 77,000,000, and the wants of this vast multitude, when they have the ability to purchase what they need or desire, must be far in excess of the results shown from 1894 to 1896, when the closest economy was practiced. The population in 1890 was only 62,622,250, and in that year we manufactured and easily marketed 9,202,703 gross tons of pig iron and 6,022,875 tons of all forms of rolled iron and steel, importing 665,771 tons of all sorts of iron and steel products in addition. As 1890 was not a boom year, but might be considered a period of fair prosperity, it would seem reasonable to make a comparison with it. On the basis of the business of that year, therefore, we should be producing pig iron at the rate of about 11,500,000 tons per annum and turning out all forms of rolled iron and steel at the rate of 7,500,000 tons. How much of an increase on recent business this means is indicated by the statistics just published of the output of pig iron in the first six months of this year, which show that 4,403,476 tons were turned out, or at the rate of only 8,800,000 tons per annum. Since 1890, also, conditions have been reversed in our foreign trade, our iron and steel imports being comparatively insignificant, while our exports are climbing to very respectable figures and the outlook for continued growth is exceedingly promising.

Perhaps never before were conditions so inviting for long contemplated improvements to be undertaken. Prices of machinery are below anything that the most economical buyer could have anticipated. Building material of all kinds is selling at almost absurd rates. Experienced contractors are surprised to find how cheaply they can cover their requirements, estimates of cost based on past business being beaten considerably by anxious manufacturers or mechanics. Competition in every line seems at this time to have gone to extremes. It is related of a prominent western heating contractor that, after figuring on the exact cost of labor and materials in a piece of work he was about to do for himself, he concluded to ask for bids from others in the trade, and found that he was able to beat his own cost prices considerably—and got the work well done, too. Similar experiences are related in other lines. Such a state of things can not last long, with the fine prospects ahead of us. Shrewd capitalists are even now taking advantage of their opportunities to make very profitable bargains, and others will speedily follow their example. Low costs are no inducement to investors when the business world is in such a depressed state that everything seems to be going from bad to worse. But when the clouds have lifted, and men are recovering their spirits and renewing their courage, it is to be expected that they will be induced to make fresh ventures, and that very low prices such as now prevail will tempt them to do even more than had been contemplated. In the expansion of general business thus effected the iron trade will necessarily reap a substantial benefit.—Iron Age.

Five ship building firms submitted proposals to the light-house board on the composite light-ship for Overfalls shoal, New Jersey, which is to be built by the Bath Iron Works of Bath, Me. The bids were: Bath Iron Works, Bath, Me., \$68,875; Columbian Iron Works & Dry Dock Co., Baltimore, Md., \$69,925; Crescent Ship Yard, Elizabeth, N. J., \$70,900; Pusey & Jones Co., Wilmington, Del., \$72,345; Gas Engine and Power Co., New York, \$87,500.

The North American Transportation & Trading Co. of Seattle has let a contract to the Cramps of Philadelphia for two 2,000-ton steamers, with a capacity of 700 passengers each, to ply between Seattle and St. Michael in the Yukon trade. It is also reported that Moran Bros. of Seattle will build for the same company six small freight and passenger steamers, costing in all about \$375,000.

The Marine Review has prepared in neat oak frames cards containing the schedule of time required to be run between certain points in the St. Mary's river under the speed limit of seven miles an hour. When hung in a pilot house, distance and time may be readily noted from these cards, as the type is large. They will be sent by express to any address at \$1 each, or may be had upon application at 409 Perry-Payne building, Cleveland, for 65 cents each.

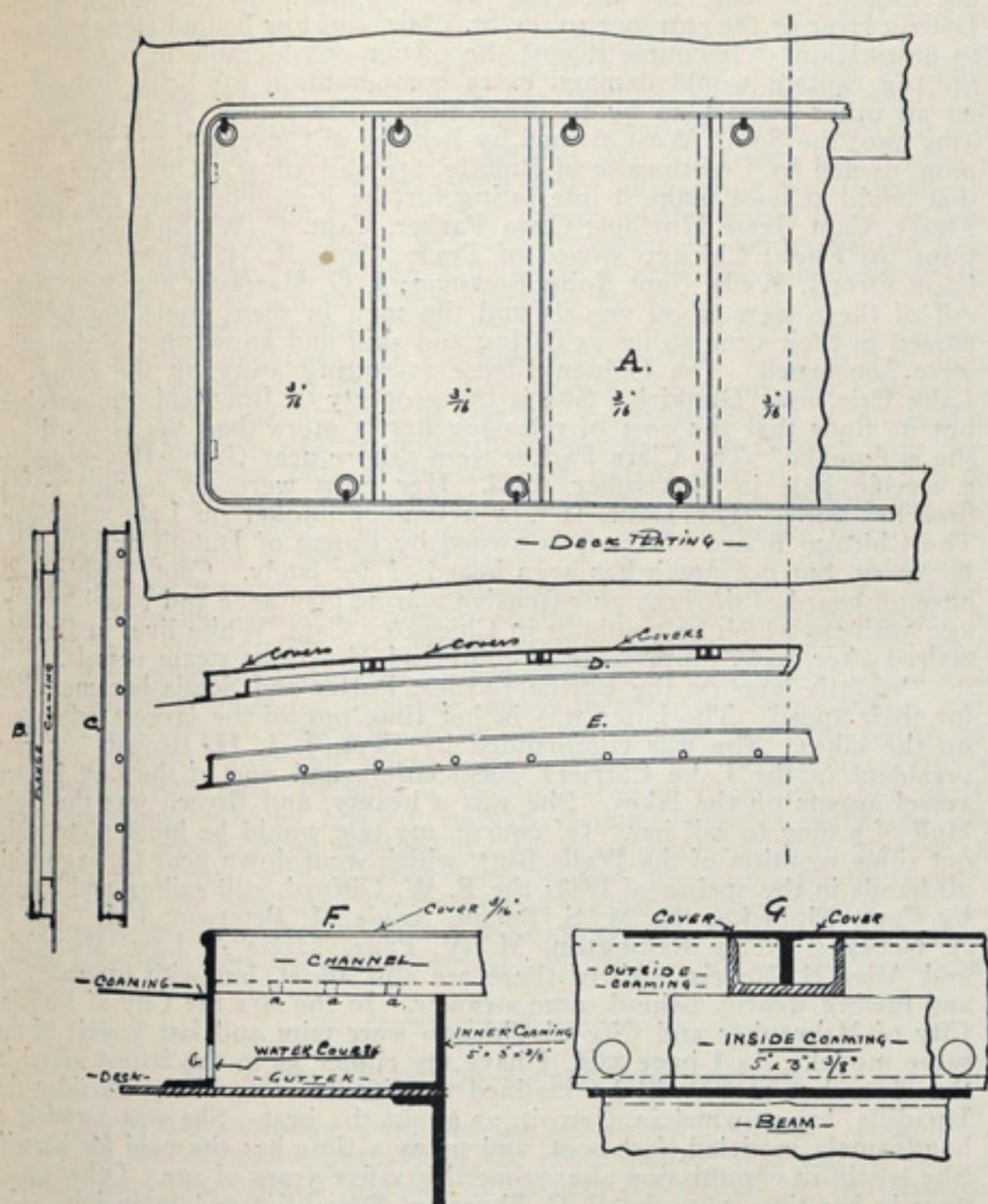
An opportunity will be given patrons of the Nickel Plate road to visit Chautauqua lake and Lily Dale, N. Y., Aug. 20. Ask agents for time of special train and rates.

The Nickel Plate road will sell excursion tickets to Chautauqua and Cassadaga lakes, Aug. 20. Ask agents.

Steel Hatch Covers.

As the tendency in lake freight steamers is to dispense with the use of wood wherever it is possible to do so, it is expected that steel hatch covers will soon be adopted in these vessels. The number and size of hatches in the big grain and ore carriers on the lakes will probably prompt the adoption of steel hatch covers here in advance of their use elsewhere. Several designs of steel covers have been suggested of late, among them one by Mr. Frank Bowman, which is illustrated herewith. Mr. Bowman is foreman machinist with the Cleveland Ship Building Co. and is well known to vessel men as an expert in the management of steering gear and other auxiliary machinery aboard ship.

This hatch cover is composed of flanged plates and channels. Fig. A shows the top of the covers, the dotted lines indicating the channels underneath, which rest on top of an angle frame forming a coaming around the inner edge of the hatch opening, as seen by sketch B. These plates,



which collectively make up the cover, are 10 by 52 inches by 3-16 inch, flanged down and fitted into the channels. Sketch B is a view looking across the ship, showing the inner coaming and the top plate flanged down. Sketch C shows the outer coaming looking across, with the number of courses suited to draining off the water. D shows the covers flanged and resting in the channels, the channels resting on the inner coaming. E shows the outer coaming, looking forward, with the drain holes for freeing the water. Sketches F and G are larger plans of the device. Mr. Bowman claims that this hatch cover can be applied to a vessel as cheaply as the present style of wood covers and with no more weight than is involved in the application of wooden covers. He claims also that no more help would be required in handling them. The ring bolts shown in sketch A can be fitted underneath the surface of the hatch by dishing the plate to receive them. It will be noted from the drawing that the channels supporting the several sections of the cover receive any water that may work through the parts flanged and fitted together, and holes are punched in the channels between the inner and outer coamings, a, a, a, to drain off the water into the gutter formed between the two coamings, the water being carried off by passing through the water courses in the outer coaming b. No canvas is needed, as it is claimed that the arrangement of flanged plates, channels, etc., is such as to receive and drain any and all water that may fall on the covers. Fastenings may be of the usual kind, either chain, flat iron or wood, but Mr. Bowman claims that there is no need of fastenings, as the arrangement of different parts of the cover is such as to keep it in position under any condition of weather.

A Valuable Ally for the Shipping Interests.

The uppermost question today with the iron and steel interests of the United States is the export of pig iron and resultant products. It is admitted on all hands that it is absolutely imperative that we should extend our export business in iron and steel, and it is certainly a matter of great satisfaction to know that leading manufacturers in these lines all over the country are declaring that legislation by congress for the encouragement of American shipping is imperatively needed. It is the key to one more great step towards establishing the industrial supremacy of the country.

In accordance with its usual reliable methods of collecting information, the Iron Trade Review has sought letters from manufacturers of iron and steel with respect to the extension of the export trade of the United States, and the answers secured from representative manufacturers throughout the country all agree that expansion of the trade depends mainly on one thing, and that is the establishment of lines of American

steamships which will carry American products at rates equally as advantageous as are now obtained by foreign manufacturers who send their products to all parts of the world. President John W. Gates of the Illinois Steel Co. says:

"The greatest handicap that the American manufacturer is laboring under today, is the fact that freight rates from American ports to foreign ports are very much higher than they are from European ports. This comes largely by the subsidizing of steamship lines from Europe to all parts of the world. What America needs most to do to extend her commerce is to subsidize steamship lines all over the world. There is no reason, in my judgment, why there should not be regular liners from New York to every port on earth; and the same might be said to be true of Philadelphia, Baltimore, Boston and New Orleans. When this time arrives, and congress sees fit to grant a subsidy and encourage American ship building as it should be encouraged, no nation on earth can compete with the United States in the manufacture of iron and steel. We have immense quantities of high grade ore which can be mined and transported at very low figures. We have the best quality of coke which can be produced at a much lower price than anywhere else in the world; and with our labor-saving devices we can pay a higher scale of wages and yet compete with any other nation."

Mr. J. G. Butler, Jr., general manager of the Brier Hill Iron & Coal Co. of Youngstown, O., writes along the same lines. He says: "I believe that we shall be forced to continue making iron and steel at low prices. Present prices are abnormally low; in many cases lower than is necessary for export. I think the only legislative action required of congress is to have in view the extension of our shipping trade. I believe that congress should subsidize our shipping the same as is done in the old countries, and direct lines should be established to the important ports. At present our export business is dependent almost wholly upon foreign bottoms and the rates are fluctuating and uncertain. I believe that, if we are not now, we soon will be the greatest manufacturing country on the face of the globe, and that it is absolutely imperative that we should extend our export business."

Care of Sick and Disabled Seamen.

In all of the important ports on the lakes, as well as on the seaboard, the United States marine hospital service enters into contracts each year for the care of sick and disabled seamen, who are treated free of charge. These contracts are made mainly for the purpose of covering emergency cases, as it is the practice to transfer patients to the government hospitals in large cities when their ailments or injuries require extended treatment. For the convenience of vessel captains who may be called upon to look to the care of sick or disabled men aboard their vessels, the following list of hospitals and nurses on the lakes under contract with the government is printed:

Ashland, Wis.—St. Joseph's hospital to furnish quarters, medical attendance, etc., and to provide for burial.

Ashtabula, O.—Medical attendance by an acting assistant surgeon; Mrs. Henry Whelpley to furnish quarters, nursing, etc.; Gregory & Burwell to provide for burial.

Buffalo, N. Y.—Medical attendance by an officer of the marine hospital service; Buffalo hospital (Sisters of Charity) to furnish quarters, medicine, etc., and to provide for burial.

Chicago, Ill.—All patients to be cared for in United States marine hospital; Bartlett & Co. to provide for burial.

Cleveland, O.—All patients to be cared for in United States marine hospital; Flynn, Abel & Froelk to provide ambulance and to care for burial.

Detroit, Mich.—Hospital patients to be cared for in United States marine hospital and out-patients to be treated at dispensary, No. 90 Griswold street; J. W. Maney to provide for burial.

Duluth, Minn.—Medical attendance by an acting assistant surgeon; St. Luke's hospital to furnish quarters, nursing, etc.; John W. Stewart to provide for burial.

Erie, Pa.—Medical attendance by an acting assistant surgeon; Hamot hospital to furnish quarters, medicine, etc.; V. Heidt to provide for burial.

Escanaba, Mich.—Medical attendance by an acting assistant surgeon; quarters, nursing, etc., at Delta hospital.

Grand Haven, Mich.—Medical attendance by an acting assistant surgeon; Anna Farnham to furnish quarters, nursing, etc.; James Barnes to provide for burial.

Ludington, Mich.—Medical attendance by an acting assistant surgeon; Mrs. H. D. Linsley to furnish quarters, nursing, etc.

Manistee, Mich.—Medical attendance by an acting assistant surgeon; quarters, nursing, etc., at Mercy hospital; Switzer & Merkle to provide for burial.

Marquette, Mich.—Medical attendance by an acting assistant surgeon; St. Mary's hospital to furnish quarters, medicine, etc., and to provide for burial.

Milwaukee, Wis.—Quarters, nursing, medicine, etc., at St. Mary's hospital; medical attendance by an acting assistant surgeon; Geo. L. Thomas to provide for burial.

Ogdensburg, N. Y.—City hospital to furnish quarters, nursing, medicine, etc.; medical attendance by an acting assistant surgeon; Nutall & Murphy to provide for burial.

Oswego, N. Y.—Medical attendance by an acting assistant surgeon; Oswego hospital to furnish quarters, nursing, medicine, etc.; John F. Dain & Son to provide for burial.

Sault Ste. Marie, Mich.—Medical attendance by an acting assistant surgeon; Mrs. Annie Little to furnish quarters, nursing, etc.; J. Vanderhook to provide for burial.

Sturgeon Bay, Wis.—Medical attendance by an acting assistant surgeon.

Superior, Wis.—Quarters, nursing, medicine, etc., at St. Mary's hospital; attendance by an acting assistant surgeon; P. O'Reilly to provide for burial.

Toledo, O.—Attendance by an acting assistant surgeon; St. Vincent's hospital to furnish quarters, nursing, medicine, etc., and to provide for burial.

Export Trade in Iron and Steel.

Mr. Archer Brown, New York resident partner of the well-known pig iron selling firm of Rogers, Brown & Co., writes as follows to the Iron Trade Review of the future of American iron trade:

"I am of opinion that the export business in American iron—both in crude and finished forms—is going to steadily increase, and in time assume large proportions. Our cheaper raw materials and our better methods of manufacture are going to win the fight. It is a singular fact that the largest business so far in American iron and steel has been done almost at the center of production of English iron, namely, Manchester and the Lancashire district. It would seem to follow easily that if we can meet the English at their very source of supply, we can beat them in the outlying distant markets where their rates of freight are as high as our own. It is not surprising, therefore, to find our trade growing rapidly in China, Japan, Australia, India, Russia, Spain, Italy, etc. The question of rebates from mining companies on ore entering into iron for export would be a different matter to manage. The railroads, however, are making lower rates for export business than for domestic, and it might be good business for the large ore and coke companies to make similar concessions, should it be found necessary to hold foreign trade after the inevitable rise in prices on this side. I know of no legislation by congress or action by American manufacturers that is especially called for in the extension of our trade abroad. The main thing is to make the goods of high quality at low cost, foster transportation lines so as to secure reliable and permanent low freight, and push energetically, persistently and intelligently for trade."

General Manager James M. Swank of the American Iron & Steel Association says that the chief impediment to the extension of our exports of iron and steel, and the chief danger under future adverse conditions to the maintenance of the present trade, lies in the deficiency of suitable ocean freight accommodation. "The missing link in our export trade of all kinds," he adds, "is direct steam communication with all parts of the world. With this link supplied there would be no temptation to compromise our protective tariff professions or to annoy friendly nations by injecting into our tariff legislation the thoroughly British policy of commercial treaties and so-called reciprocity. Our low prices and the excellent quality of our products would do the rest. They are accomplishing wonders as things are."

Passing Signals in Fog.

The discussion about passing signals in fog, which has filled the marine columns of lake newspapers for two or three weeks past, is entirely a one-sided affair in the eyes of competent vessel masters, who know that there was really no grounds for discussion. But the result will be beneficial, as it will impress everybody interested in lake commerce with the fact that regulations pertaining to lake navigation in this regard have no reference to the rules made by the International Marine Conference, but are contained in the so-called White law, which provides for passing signals in all kinds of weather.

Probably it would be best to have the discussion end with the plain statement of the law that has been made by several authorities, but it would be interesting to know whether any steamboat inspector on the lakes has really been of the opinion up to this time that passing signals were to be used only when vessels were in sight of each other. Such an impression was conveyed by the article in the Detroit Free Press, which started the discussion. In that article the statement that laws pertaining to the lakes prohibited passing signals in fog was credited to "a steamboat inspector," not one of the Detroit inspectors, but it was naturally supposed that a Detroit newspaper would be quoting a Detroit inspector. It would probably be in order, then, for the Detroit inspectors to declare themselves in this regard. The Free Press reporter would probably take cover under the claim that he would be violating an unwritten law of the profession if he should at any time divulge the source of information given in confidence. But, after all, it may be that the inspector was a dummy in the fertile brain of the newspaperman, who is prolific in the art of doctoring reprint.

Reduced Coal Bills.

Officials of the Dry Dock Engine Works, Detroit, are very much pleased with a letter which they have just received from Mr. W. B. Castle of Cleveland, secretary of the Republic Iron Co. The letter is a valuable endorsement of the Howden hot draft system, which was applied to the Republic company's steamer Continental with a view to reducing coal bills. Mr. Castle says:

"As promised, I now give you a few figures with reference to our steamer Continental. During 1896 she averaged 8 miles an hour, burning 234 pounds of coal per mile and 1,871 pounds per hour. During the first six trips of 1897 she averaged 8.39 miles an hour, burning 171 pounds per mile and 1,434 pounds per hour. Last year the Continental burned nothing but lump coal. This year she has burned principally run-of-mine. She is also carrying about 20 per cent. more ore this year than last, owing to the increased draft of water."

Capt. Daniel Nelson, whose death is announced from Milwaukee, was very well known around the lakes. His first command was the schooner John Schuette, and his second the schooner Granger. He then assumed command of the steamer Louis Pahlow for the Delta Lumber Co. of Detroit, and when that corporation purchased the steamer Sachem he secured an interest and commanded her until she was sold and the steamer Ionia purchased. He had an interest in this steamer also, and sailed her until the close of last season, when poor health compelled him to quit sailing.

Notice of two more gas buoys established in the St. Lawrence river has just been published by the light-house board. Both are black buoys showing fixed white lights. One is located about a quarter of a mile S. W. $\frac{1}{8}$ S. from Sunken Rock light-house, and the other is about one mile S. S. W. $\frac{1}{2}$ W. from the southerly point of Carleton island, taking the place of the black spar buoy which was known as Feather-Bed shoal buoy.

Schooners of Early Days.

Old-time vessel men are always interested in reminiscences of the days when the grain trade of the lakes was handled by a fleet of fast sailing vessels. A veteran among lake captains contributes an article to the Detroit Free Press about some of these ships, of which he had personal knowledge.

"One of the best of them all," he says, "was the bark North West, of which Capt. George McLeod, now so prominent in marine insurance circles, was master. From her he went into the South West, also a fast one, Arthur Atkins taking the other. Then there was the Champion, Capt. Calvin Carr. These three led all the fleets in the '70's. I had more faith in the sailing ability of McLeod than the others gave me. He was always on deck, quick, alert, with his sail all up and drawing whenever there was a chance for it, and quite popular. So keen was the rivalry between these three vessels that their masters, if they were together, did not hesitate to take the first tug when approaching the mouth of the Detroit river or the entrance to the St. Clair, and tow behind alone through to destination. Of course it cost the owner considerable in tow-bill, for the tug captain would demand extra compensation for being obliged to let all other vessels go by to other tugs. The North West passed out long ago; the South West, owned by Bradley of Cleveland, and the Champion, owned by Crosthwaite of Buffalo, are still afloat. Other rapid ones that could at least make it interesting for the foregoing were the Golden Fleece, Capt. Jesse Hurlbut; Clara Parker, Capt. C. W. Elphicke; Lotus, Capt. Al Fitch; Chicago Board of Trade, Capt. R. H. White; Newsboy, Capt. Orr; J. Wells, Capt. John Bowman; J. G. Masten, Capt. Bob Todd. All of these were good vessels and the men in them could not be surpassed in their time so far as daring and skill and knowledge of the lakes were concerned. The Golden Fleece is rotting away on the shores of Lake Erie, near Dunkirk. She is the property of Jim Reid, the wrecker, but he finds that the cost of releasing her is more than she is worth, so she is doomed. The Clara Parker went ashore near Grand Haven during a terrific gale in November, 1883. Her crew were all rescued in the breeches-buoy. The Lotus is now a lumber hooker on Lake Michigan. The Chicago Board of Trade is owned by Inman of Duluth or Hawgood & Avery, but not much has been heard of her lately. Capt. Elphicke we have all heard of through an extensive marine insurance and vessel brokerage business which he conducts in Chicago. Capt. White lives in Detroit, retired after many more years in command of various steam vessels."

"A little later on the Bertha Barnes, Porter and Scotia became noted for their speed. The latter was in her time one of the largest schooners on the lakes. She was commanded by Capt. J. J. H. Brown, last year president of the Lake Carriers' Association, and one of the best known vessel agents on the lakes. She was a beauty, and Brown was the right kind of a man to sail her. Of course, my tale would be incomplete without some mention of the Wells Burt, which went down near Chicago with all hands in the spring of 1883; the F. W. Gifford, still sailing and owned by Capt. Elphicke; the M. S. Bacon, Annie M. Peterson, J. I. Case, F. A. Georger, Nellie Redington, M. W. Page, Lizzie A. Law, Moonlight and Alice B. Norris. All of these are still afloat, but with topmasts off and towing wearily behind some steamer. In the '60's the City of Buffalo, City of Milwaukee and City of Chicago were trim and fast vessels of the same model. As I have said, I have my choice as to the fastest vessel in the '70's, but some will be inclined to dispute me. Many consider the Unadilla, long owned in Detroit, as about the best. She was certainly a handsomely-modeled, fast boat, and many a time has she paid for herself. She is still in commission after some thirty-five years of age. Other smart ones in her time were the P. C. Sherman, Sam Flint and Invincible. The Flint is afloat, but the others have passed out. All these were square-rigged and carried royals. I remember once when the Lotus came out with a varnished bottom, the captain having the idea that it would not only preserve the wood, but make her more slippery. Soon the bolt-heads began to drip rust, and then she was painted black. The James Couch, now the Tasmania, had trim-boards on the sides. The Ogarita was flat-bottomed, beamier than anything then afloat, and the largest carrier on the lakes for her inches. The big Michigan, now owned by the Owen estate of Detroit, was the first double-decked schooner on the lakes. She was sailed for many years by Capt. Fred Hart, now the manager of the fleet."

First Meeting of the Deep Waterway Engineers.

The first meeting of the board of engineers recently appointed by President McKinley to continue investigation of the subject of a deep waterway from the lakes to tidewater, was held at the office of Major C. W. Raymond in Philadelphia on the 11th inst. The engineers were in session three days. A programme of work was blocked out for commencing field operations and arrangements made to have survey parties organized as soon as possible. The observation party to determine the discharge of Niagara river, and the survey party to make a survey and examination of a canal route from Lake Erie to Lake Ontario will commence work as soon as the parties can be organized and the necessary outfit of instruments obtained.

A record, covering several days past, of the draft of water at Ballard's reef, now the danger point in the rivers, may prove interesting to vessel captains. The figures from records of the government engineers are as follows: August 9, 17 feet 6 inches with wind south, moderate; August 10, 17 feet 1 inch, northwest, strong; August 11, 17 feet 6 inches, northwest, light; August 12, 17 feet, northwest, fresh; August 13, 17 feet 5 inches, south, moderate; August 14, 17 feet 8 inches, southwest, strong; August 15, 17 feet 4 inches, south, strong.

A circular from the United States engineer office, Cleveland, announces that at the regulation speed of 8 miles an hour for passage through Toledo straight channel, which equals seven and one-half minutes per mile, the time allowance in passage is: From outer can buoys Nos. 1 and 2 to main crib, 3 miles, 22½ minutes; from main crib to black spar No. 21, 2¼ miles, 17 minutes; from black spar No. 21 to inner red can No. 30, 2¼ miles, 17 minutes; total, 56½ minutes.

Results of the System of Premiums for War Vessels.

An article in a recent issue of the New York Sun sums up, as result of the speed trial of the Nashville, last of the naval vessels open to a premium, the results of the premium system in the United States navy, which involved the payment of \$3,296,626 to American ship builders. Premiums began under Secretary Whitney, with awards for horse power at the rate of \$100 per unit in excess of the contract requirements. Under that system the Yorktown earned \$39,825, the Newark \$36,857, the Concord \$453, the Bennington \$3,609, and the Baltimore \$106,442. In all cases there was a penalty of \$100 per unit for any shortage in horse power, and under it the Charleston lost \$33,823, the Monterey \$32,823, and the Petrel \$485. Soon, however, it was determined to give premiums for speed, irrespective of horse power. It was no satisfaction to the government to know that vessels had a large indicated horse power without speed, and if they had speed it made no difference about the horse power. Under this plan the Wilmington earned \$41,500, the Bancroft and the Machias \$45,000 each, the Nashville \$45,980, the Helena \$49,940, the Castine and the Indiana \$50,000 each, the Philadelphia, the San Francisco and the Massachusetts \$100,000 each, the Marblehead \$125,000, the Detroit \$150,000, the Oregon \$175,000, the New York and Monterey \$200,000 each, the Iowa \$217,420, the Olympia \$300,000, the Columbia and Brooklyn \$350,000 each, while the Minneapolis broke all records with earnings of \$414,600. Not a single vessel lost anything on this speed basis, and one vessel, which on her official trial fell far short of her estimated horse power, so that she might have had to pay a very heavy penalty on that basis, really gained a magnificent premium for speed.

"The highest excesses of speed," says the Sun, "were those achieved by the smaller gunboats, the Castine, for example, making 2.62 knots over her guarantee, the Machias 2.46, and the Bancroft 2.37. Nevertheless, theirs have been among the smallest speed premiums paid, since on the smaller vessels smaller rates of premiums were allowed, the three mentioned receiving only \$5,000 for each excess quarter knot. On the other hand the Philadelphia and the San Francisco earned \$100,000 each for somewhat over half a knot in excess of their contracts, because they had the big bonus of \$50,000 per quarter knot, or ten times as much as the gunboats just spoken of, while the enormous earnings of the Minneapolis, Columbia, Olympia and Brooklyn, amounting to \$1,414,000 for these three vessels alone, are accounted for in the same way. A single firm, the Cramps, of Philadelphia, earned the great extra sum of \$1,865,144, never losing a dollar for penalties, either in speed or horse power. The system was stopped after the prodigious winning of the Minneapolis had been recorded, although subsisting contracts for premiums were, of course, carried out. Perhaps a reaction was then natural; and if the system should ever be revived, perhaps smaller bonuses would be paid than those which allow \$200,000 for an extra knot. But at present the view taken is that, with the experience gained, premiums are not needed, and, in fact, the composite gunboats and the torpedoboat Porter, without premiums, have far exceeded their contract speed. However, contractors now take into view that no premiums are payable when they make their bids."

To Move Manitoba Grain via Duluth.

Canada has another railway scheme mixed with politics. It is of interest on the lakes as it pertains to the movement of Manitoba grain. A line of road is projected between Winnipeg, the capital of the Canadian province of Manitoba, and Duluth. By a direct line of about 350 miles between the two points, by far the greater portion of it lying within the state of Minnesota, it is expected to bring the principal part of the product of the immense wheat fields of Manitoba to the lakes at Duluth for shipment to Buffalo, whence it will be forwarded to New York and shipped to Europe instead of going over the Canadian Pacific railway to Montreal direct or to Fort William and thence largely by Canadian vessels to Montreal.

The political feature of the enterprise is found in the evident intention of Premier Greenway to run the next Manitoba election on the issue of making a contract with the proposed railway by which, in consideration of a bonus to aid its construction, grain is to be carried to Duluth for 10 cents per 100 pounds, or but little more than half the rate now demanded by the existing circuitous line between the two points. Bitter political opposition is being made to the project. The cry is raised that it is a direct blow to the Canadian Pacific railway, largely built with government aid; that it will rob the English stock and bondholders of that line; that those interested in the projected road are mostly New Yorkers, and that it will benefit New York to the damage of Montreal, give employment to American instead of Canadian lake tonnage, and inflict injury on eastern Canadian interests. The Greenway supporters make no other reply than that their platform is "Manitoba first," and that they "are resolved to get lower wheat rates by establishing a direct route to New York via Duluth and Buffalo, which is Manitoba's natural route to the seaboard."

Collector of Customs Gott of Amherstburg is in receipt of a letter from the Dominion department of marine and fisheries relative to the wreck of the schooner Adams near Colchester, and enclosing a copy of the report of Capt. Dunn of the steamer Petrel, who recently made an examination of the wreck. Capt. Dunn reports that there is a considerable space with but 18½ feet of water over the wreck and in two places there is but 14 feet of water. Capt. Dunn placed a flag buoy over the wreck. Mr. Gott is instructed to call on the Michigan Wrecking & Salvage Co. to complete the removal of the wreck in accordance with the terms of their contract, failing which the work will be done by the Dominion government and costs collected from the bonds of the company. The contract called for 25 feet of water at the place of the wreck.

Two G. A. R. Buffalo specials via the Nickel Plate road leave Cleveland, one Aug. 23 at 1:00 p. m., and another at 10:00 a. m., Aug. 24. Inquire of agents for details. 273

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

Buffalo Grain Matters.

Editor Marine Review:—I was much surprised to find in your usually carefully made-up paper last week an article on the "Fear of a Grain Blockade in Buffalo," the reason or excuse for which I am at a loss to determine. A grain blockade in August in a harbor that is crammed full of elevators and is adding to its big list as fast as Buffalo is! This would be news that would make the average elevator man wild with joy. Such a report might gain credence outside of grain circles, but hardly in them. The fact is that the receipts of grain fell off last week. The entire amount was only about 4,000,000 bushels, which could be handled very comfortably in two days, provided there are cars enough to keep the elevators from filling up. Without cars or boats to carry the grain out, our elevator capacity would need to equal the entire western crops to make sure of sufficient capacity.

Instead of Buffalo "receiving grain now about as fast as it can comfortably take care of it," no one here has thought of such a thing, and twice the present receipts could be handled with ease, always provided the outgoing service is good. It does take longer to unload vessels than it used to, so that charge will not be disputed, but there is ample reason for that. When cargoes run up to 6,300 net tons, which is now the limit, with very many running close to the 6,000-ton line, it is not easy to prevent their being "split up into several different consignments." Indeed, a straight cargo of such great size would be a wonder. The result is that the 400-foot vessels are obliged to take a third day to get their cargoes out, even if the delay is little or nothing. This phase of the situation is unavoidable and will become more marked as the smaller vessels are replaced by big ones.

Now as to blockades. Buffalo has had a good many of them, on paper, but to my certain knowledge she has never had but one worth the name. That was in the day when our elevator capacity was about half what it is now, and moreover was due to certain railroads, principally the New York Central, getting hold of the great bulk of the grain and insisting on unloading it all at their own houses. At that very time the canal was doing next to nothing and stood ready to relieve the overflowing elevators had it been permitted, but no, the grain must go out by rail. Hence the squabbles and the lawsuits that followed. All this discussion of the situation ought to make plain to vessel men that they should begin a ceaseless agitation against an abuse here that is to blame for much cost and delay. The Buffalo elevators are, all but one or two, pooled as to earnings, and they are not allowed to pay for the privilege of handling cargoes as used to be the case. When this rebate system was cut off another step should have been taken. There is no earthly use of a vessel being sent to half a dozen elevators to unload. They are all connected by practically the same local railway system, and if a strong fight was made in favor of the vessel delivering her entire cargo at the elevator where most of it is consigned it would succeed in the end, and the problem of rapid handling of grain would be immensely simplified. The various elevators could give and take and this resultant pooling would work just as the existing one does. It is plain that vessel men do not own elevators, or this reform would have been made long ago.

Buffalo, August 16, 1896.

JOHN CHAMBERLIN.

Lake Vessels for the Klondyke Region.

Klondyke gold seekers are drawing on the lakes for vessels suited to service on the famous Yukon and its tributaries. It is announced that George Craig of Toledo has sold the stern-wheel river steamer Valley City to John Cudahy of Chicago. She will be taken apart and shipped by rail to Seattle, and from there will go by steamer to St. Michael, Alaska. Together with five other small steamers now building at Seattle, the Valley City will be used on the Yukon river and tributaries in carrying supplies and furnishing transportation to the miners in the Klondyke gold fields. The vessel registers 220 tons and is 143 feet long by 29 feet beam. She was built in 1892.

Murphy & Miller, Cleveland ship builders, also have a gold hunting scheme on hand. They propose to form a company of twenty young men who are to take part in an expedition next spring, for which a vessel is to be specially built. If plans for the formation of the company are successful, the vessel will be built here, taken apart and shipped by rail to Seattle, where she will again be put together for the trip to Alaska.

In answer to a challenge, through one of the Detroit newspapers, from Rockmann Bros., owners of the yacht I. C. U. of Detroit, W. J. Connors says in the Buffalo Enquirer: "My yacht, the Enquirer, is the champion of the great lakes. I am willing to race the Detroit boat, and when I get an official challenge from the men who own the I. C. U., I will at once talk business with them. As champion, I shall demand a race from Buffalo to Erie, a distance of eighty-two miles, on some day to be agreed upon mutually. I will race for nothing less than a \$500-cup. If the Detroit men want to try conclusions with the Enquirer on this basis, my boat and my money are ready for them any time." But it is not at all probable that there will be a race between the Enquirer and the I. C. U. The latter is a small open launch, intended for racing purposes in the rivers. There is no reason why the owner of a yacht like the Enquirer should pay any attention to such a challenge.

It is expected that the big dredge that is being built at Buffalo for work on Hughes Bros. & Bangs' extensive breakwater contract will be launched in a few days. A clam-shell dipper on this big machine is said to weigh fifteen tons and to be capable of lifting ten cubic yards of earth, which would probably be equal to fifteen tons. In construction of the dredge itself 250,000 feet of white pine and oak timber will be used. Some of the timbers are 18 to 20 inches square and 60 to 70 feet long. The derrick timbers are 18 inches square. The dredge is 145 feet long over all, with 40-foot beam and 12-foot sides. Its cost is said to be about \$50,000.

Chautauqua excursion, Aug. 20, via the Nickel Plate road. Without extra charge, the return tickets are available via Lily Dale on Cassadaga lake and Dunkirk. Ask agents about it. 280



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio,
by John M. Mulrooney and F. M. Barton.

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binders sent, post paid, \$1.00. Advertising rates on application.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	Number.	Gross Tonnage.
1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
Total.....	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages.....	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered.....	17,249,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation.....	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

It is quite evident from reports emanating from different departments at Washington that the administration will do all in its power to bring about the adoption of an act of some kind favorable to American shipping at the next session of congress. The treasury department seems to be giving special attention to statistics bearing upon this question. A report just issued from the treasury directs attention to the fact that British vessels are carrying over 55 per cent. of the merchandise of the United States, both of imports and of exports. Examination of figures for the first six months of this year shows the total imports in vessels have been of the value of \$432,689,981, and of domestic exports in vessels \$452,800,405. The percentage of imports carried in American vessels is 15.35, and in foreign vessels 84.65. Of imports in vessels the British carried 55.89 per cent.; the Germans, 11.49; French, 5.46; Dutch, 3.30; and all other foreign, 8.51; of domestic exports only 8.19 is carried in American bottoms, 91.81 being carried in vessels of other nations. British vessels carry 68.23 per cent. of the value of exports by vessels; German, 8.29; French, 2.19; Norwegian, 2.93; and all other foreign, 9.54. The value of imports carried in American vessels during the period of six months referred to, was \$66,428,149, and of that carried in foreign vessels, \$366,261,832; and the value of exports for the same period carried in American vessels was \$37,113,168, and of that carried in foreign vessels, \$415,687,237.

"Small profits and large sales must be the motto of the iron and steel manufacturers of the United States from this time forward," says President John W. Gates of the Illinois Steel Co., "and only those plants which are favorably located and thoroughly modern and are operated at their fullest capacity can make money." This statement is made in a letter dealing with the future of the iron and steel business of the United States. In the same letter Mr. Gates sounds a warning to the railway companies that are engaged in the transportation of iron ore and other raw materials that enter into the manufacture of iron and steel. "As it now looks to me," he says, "1898 will be one of the best years the iron and steel business has had for many years. By this I do not mean extravagantly high prices, but fair living profits; and if the railroads of this country that have outside mines located on their lines do not take care of the interests of the mine owner, it will only be a short time until the two big steel concerns who own their railroads, mines and fleets of steamers to transport the ore, will be doing all of the iron ore business in this country."

Considerable comment has been made in the daily press and elsewhere, growing out of the complaint of a lake master that his passing signal in a fog had not been answered by other steamers, and from the opinions, including that of one of the local inspectors of steamboats, quoted by a Detroit paper, it appears that there is a diversity of opinion as to whether passing signals are permissible in a fog when the vessels are not in sight of each other. It seems proper to call attention to the fact that the rules governing the navigation of the great lakes do not, as has been stated, prohibit the use of passing signals in a fog, but they require that "in all weathers every steamboat under way in taking any course authorized or required by these rules shall indicate that course by the following signals on her whistle," etc. By the international rules of 1890 passing signals were prohibited when the vessels are out of sight

of each other, and by the international rules of 1895 they are also prohibited. The inspector and others, in stating that they are not permitted, doubtless have in mind the international rules and not the White law, so-called, which governs the navigation on the lakes.

The outcome of the recent investigation into affairs of the Brooklyn navy yard is certainly very pleasing to everybody who is acquainted with the political methods and "pulls" that have prevailed at that institution in the past. Among people who know Naval Constructor Bowles there was no question of the result of the investigation as far as he was concerned. Anyone working under Mr. Bowles will do his full duty. The investigation brought out the best kind of proof of his efforts to raise the standard of work in the Brooklyn yard, and as the report shows, he has absolutely disregarded all political considerations in appointing and employing men; and the opposition to him evidently arises mainly from the fact that under him, for the first time, it has been impossible to procure the reinstatement or retention of men guilty of misconduct who possess political influence.

Of the several protests from departments of the government against regulations from the civil service commission regarding the appointment of assistants, that coming from the army engineers seems to be the first to have been at all successful. Some of the engineers claimed that they were greatly hampered in their work by being forced to accept assistants who were not fitted for the duties. After a great deal of correspondence, containing numerous specific complaints, the regulations have been so arranged that the engineers now say the civil service extensions will work in a most satisfactory manner. The right of selection of men from any branch of the classified service has been extended, so that the officers can investigate and inform themselves of the qualifications of clerks and other subordinate employees before accepting them.

As there is considerable uncertainty regarding the interpretation of certain features of the new tariff law relating to duties on materials used in government works, the secretary of the treasury has instructed the collector of customs at Buffalo to admit to entry the Canadian stone needed for the work on the Buffalo breakwater, pending a final settlement of the question. It is said at the treasury that the usual provision in tariff acts admitting free of duty articles of any character intended for government use was stricken out, also that the duty on this stone will have to be paid by the war department from its present appropriation, or congress may be asked at its next session to remit the duty. Abuse by contractors of the privilege of entering goods free for government use, it is said, was the cause of the provision being stricken out of the present act.

American prices are evidently attracting attention the world over. A late report from Chicago is to the effect that there is an inquiry in that market for about 4,000 tons of bridge work for Japan. Interest in the export trade continues lively, but it is wise not to exaggerate the facts. Thus we have been told of shipments of pig iron at the rate of 1,000 tons a day. The fact is that the June exports were 13,938 tons, while the total for the fiscal year 1896-1897 was 168,890 tons. This is about a week's work for our active furnaces. The rail exports for the same fiscal year were 107,891 gross tons, while the shipments of billets and rods footed up to 46,248 net tons, those of cut nails to 12,738 net tons, of wire nails 4,476 net tons and of wire 53,865 net tons.—Iron Age.

Men who build boilers for ships are well represented among officers of the American Boiler Manufacturers' Association elected at the annual meeting in Philadelphia recently. The new officers are as follows: President, Henry J. Hartley of the Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia; secretary, E. D. Meier of the Heine Safety Boiler Co., St. Louis; treasurer, Richard Hammond of the Lake Erie Engineering Works, Buffalo; first vice-president, James Lappan, Pittsburgh; second vice-president, Daniel Connelly, Cleveland; third vice-president, John O'Brien, St. Louis. The next meeting of the association will be held in October, 1898, at St. Louis.

More contracts for Erie canal enlargement work, all of which are involved in the \$9,000,000 improvement project, will be let at Albany shortly. On Aug. 24 the state superintendent of public works will open bids for improving 69.76 miles of the eastern division and 7.2 miles of the middle division of the canal, and on Sept. 3 bids will be opened for the improvement of 67.34 miles of the western division. Plans and specifications are now on view at Albany, also at the office of Thomas Wheeler, assistant superintendent of public works, Syracuse, and at the office of R. G. Lay, assistant superintendent of public works, Rochester.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, August 14, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	2,521,000	10,128,000
Duluth	1,053,000	157,000
Milwaukee	142,000	107,000
Detroit	158,000	25,000
Toledo	540,000	380,000
Buffalo	424,000	444,000
	4,838,000	11,241,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 776,000 bushels of wheat and an increase of 843,000 bushels of corn.

G. A. R. encampment at Buffalo, N. Y.—The Nickel Plate road sells low-rate excursion tickets Aug. 21, 22 and 23. Tickets may be extended to Sept. 20. 232, Aug 21

Fear of American Competition.

An article in the London Times of recent date proves conclusively that there is a genuine fear in England of competition from American iron and steel manufacturers. It was written by a specialist and is worthy of careful study from everybody connected with the industry in this country:

"The Duke of Devonshire, in presiding recently over the annual general meeting of the Barrow Hematite Steel Co., pointed out that the revival of business which took place last year had not been so pronounced as that which occurred in 1889-90, and that prices had not taken by any means so high a range as they did on the occasion of the last revival in those industries. There are, of course, two ways of comparing one period with another from a purely business point of view. One is to adopt the measure of volume; another is to apply the test of price. Judged by the former criterion, it appears from the statistics which have recently been compiled and issued by the British Iron Trade Association that the improvement of trade in 1896 was the most notable on record, at any rate so far as pig iron and steel are concerned. The total make of pig in Great Britain in that year was 8,563,209 tons, or an increase of 667,534 tons on the output of the previous year. This is the largest output that we have had in this country, but it is not so large as several annual outputs in the United States, and notably those of 1890 and 1895, in both of which years the American output exceeded 9,000,000 tons.

"It is no secret, however, that the output of iron would have been still larger but for two circumstances of a more or less abnormal character—the first, the scarcity of iron ores, which has been seriously felt almost for the first time in the history of our iron trade; and the second, the demoralizing effect on prices and production exercised by the importation into British markets of pig iron produced in the United States. So far as the first of these influences is concerned, a great strain was put upon all the ordinary sources of supply, both at home and abroad, to furnish a notably larger output of ore in 1896. As a result, we were able to import about 1,000,000 tons more of hematite ore from Spain and other countries in that year. This increased output of foreign ore for British blast furnaces would be equal to an output of about 500,000 tons of pig iron, so that the actual increase of home iron ore output would not be more than 400,000 to 500,000 tons. In other words, the increased output of British iron in 1896 was not accompanied by any corresponding increase of home ore production, but was mainly dependent on increased imports of foreign ores, which are generally regarded as a somewhat precarious source of supply, in view of the threatened exhaustion of the ores of the north of Spain and the anticipated higher cost of the ores procurable from other foreign sources, which are mainly the south of Spain and the ore deposits of Gellivara, within the Arctic Circle, and Grängesburg, in Sweden. It is not too much to say that almost every iron-making firm in Great Britain engaged in the manufacture of hematite iron, which is nearly one-half of our total output, is at present anxiously concerned about the question of future ore supplies, and is more or less apprehensive that a few years hence at the most will witness such a depletion of cheap foreign ores and such an increased cost, due to higher cost of freights by railway or sea, in respect of other possible sources of supply, as seriously to threaten the maintenance of the relatively cheap iron output hitherto enjoyed by this country. This apprehension, however, may not be justified by the results. While it is probable that there is no second Bilbao available for the British iron trade, it has within the last two or three years been demonstrated that Spain has very large undeveloped resources in iron ores of a high quality, and in quite a number of cases these have been acquired by leading British firms.

"The second point affecting our iron and steel industries in the past year was the introduction into our home and foreign markets of the new factor of American competition. On this point the Duke of Devonshire remarked that 'in the American competition the cutting down of prices appeared to be something astonishing,' and he expressed the hope that 'American competitors might be satisfied to confine a good deal of their fighting to their own country.' The American iron trade, however, does not show the least intention of thus limiting its markets. On the contrary, they are making their plants all along the line for much more successful rivalry than they have hitherto achieved, and that largely by means which were brought to the notice of the duke and his codirectors on the Barrow board by Sir Edward Carbutt on the authority of Mr. Windsor Richards, the president of the Institution of Mechanical Engineers. It appears that the most remarkable of these means is the gigantic scale on which American iron-making plants are now built and operated. As a case in point, the new blast furnaces of the Carnegie company, at Duquesne, near Pittsburg, may be referred to. Each of these furnaces is producing at the rate of 200,000 tons of pig iron per annum, whereas the British Iron Trade Association figures show that the average annual output of the British blast furnaces in operation during 1896 was only 23,682 tons. Hence a new Carnegie furnace will produce more than eight times the average of our British furnaces, and hence also the remarkable conclusion that, if British furnaces were equipped to do as much as these furnaces at Duquesne, about forty furnaces would do the work that we employed 362 furnaces to do in 1896. It is much the same with other branches of the iron industry. According to a well-informed writer in a recent issue of the Iron and Coal Trades Review, the newest type of Garrett wire mill used in the United States can produce about 100,000 tons of wire rods per year, which is very far in advance of any output recorded in this country, where the mills are of a different type; and it is further shown that some of the most improved rail mills in the United States are capable of producing about 50,000 tons of finished rails per month, which is more than the total output of rails in Great Britain, and probably nearly three times as much as any rail mill can produce in this country in one year. These figures appear to be almost incredible, and in times past similar statements have been pooh-poohed by our ironmasters as mere Yankee bluff and buncombe. But this is no longer the case. On the contrary, some of the most recent plants constructed in this country have adopted American methods, and the Duke of Devonshire, as chairman of the great Barrow company, practically admitted American superiority. He did not, however, add, as he might have done, that the most wonderful thing about this American competition in rails, blooms, billets and wire is the fact that the ores used have to be conveyed a distance of 600

to 800 miles to the blast furnaces, and that the finished products have to be carried from the interior, 500 miles from tide water, to New York, and thence transported a distance of 3,200 miles by sea, before they enter into competition with British-made steel, which has no such great distances to cover, but, on the contrary, is in all cases manufactured close to shipping ports. Needless to add, the main element that enables the American iron trade to achieve this striking result is cheap transport by rail and water. While the British iron trade continues to be handicapped by railway freights which average for mineral traffic from a penny (2 cents) to 3 halfpence per mile, the American iron traffic is now being carried over a large area for 3 mills per ton mile, or one-seventh of a penny; and this, it is expected, will become an established rate in the future for mineral traffic carried on a large scale.

"So far as the British steel industry is concerned, the figures collected by the British Iron Trade Association show that the output of Bessemer ingots for 1896 amounted to 1,815,842 tons, which is an increase of 280,617 tons on the output of the previous year. The output of open-hearth steel is rather over 2,000,000 tons, which is the largest output hitherto recorded in the history of this industry. The total output of British steel of all kinds in 1896 amounts, therefore, to close on 4,000,000 tons. The American and German outputs for the same year have not yet been definitely stated, but it is believed that the former will not be much short of 5,000,000 tons. The output of basic Bessemer steel ingots in 1896 amounted to 457,262 tons, against 441,550 tons in the previous year. The basic process, which enables a large proportion of our home ores to be utilized, fails to make anything like the progress at home that has been achieved abroad, mainly because British engineers and steel users specify for acid or ordinary Bessemer or open-hearth steels, to produce which we have to import suitable ores chiefly from abroad. Some authorities believe that the basic process will make much more rapid progress in this country if imported ores become dearer, as we have indicated the probability of their doing; but that and other problems at present pending in the iron industry must await the determination of events."

Submarine Torpedo Boat Plunger.

The name Plunger, given to the Holland submarine torpedo boat, which was launched at the Columbian Iron Works, Baltimore, a few days ago, certainly seems appropriate when applied to a vessel of her kind. Trials of this vessel will not take place until next spring, although a similar craft, built without aid from the government, and launched some time ago at Elizabethport, N. J., is now about ready for an extended series of trials. If vessels of this type prove successful, even to a degree considerably below the expectations of the Holland company, large appropriations from the government for their development are assured. The vessel just launched at Baltimore is 85 feet long and 11.5 feet diameter. Her displacement when floating light is 155 tons, and when down to her load water line the displacement is 160 tons. Two sets of motive power are provided, one for the afloat and awash condition, and one for the submerged condition. Twin quadruple expansion engines, with steam furnished from a water tube boiler, will operate twin screws when afloat or awash, and a 70 horse power motor, fed from forty-eight chloride cells will furnish the power when submerged. The steam power, electric dynamo and storage cells are so connected as to be readily reversible in their action, thus rendering it possible to recharge the cells from the dynamo, the steam engine being used as a prime motor. The electric power may also be connected to a propeller shaft placed in the axis of the boat, in addition to the connection with the main propeller shafts. The motor may thus operate a special propeller, in addition to driving the main shafts independently of the steam engines. The capacity of the storage cells is amply large to prevent injury or deterioration while giving off the power required to propel the vessel—a speed of about 8 knots for at least six hours. It is expected that the vessel will reach a speed of 16 knots in the light conditions, while she will be able to reach 15 knots with 3 feet of water covering the hull, not less than 8 knots submerged. At these speeds an endurance of fifteen hours awash and ten hours submerged is anticipated. She will carry no guns or other armament except five automobile torpedoes to be launched from two expulsion tubes. Two additional torpedoes can be carried, if desired.

Naval Vessels Afloat and Under Construction.

As it is only within the past ten years that the United States has given attention to the building of a navy, there is certainly no cause for discouragement on account of the great display of naval power made by the Britishers in connection with the jubilee celebrations. Notwithstanding the influence of interior interests in this country that are opposed to naval expenses, we now have afloat and in process of construction eighty-nine modern vessels, besides sixteen old ones that are still fit for some kinds of service, making in all 105 vessels. The fighting strength of this fleet consists of six seagoing battleships afloat and five now in process of construction, two heavily armed and armored cruisers, one armored ram, six double turret monitors which make effective coast defense vessels, and thirteen single turret monitors which would also be of considerable value for coast defense, making in all thirty-three armored vessels. Then we may also consider as fighting ships of the most effective type the twenty-two little torpedo boats, most of which will be afloat within the next twelve months. These are not armored, but carry the most powerful engines of destruction and are protected from heavy guns by their small size and partial or complete submersion. Besides these, our sixteen heavily armed but unarmored swift cruisers make very effective ships, and for police duty and river work we have fifteen gunboats of the most effective type. Add to these the three special class vessels, Bancroft, Dolphin and Vesuvius, and we have completed the list of effective modern vessels.

Two special trains will be run via the Nickel Plate road to the G. A. R. encampment at Buffalo, one leaving Cleveland Aug. 23 at 1:00 p. m., arriving at Buffalo at 6:00 p. m., and the other leaving Cleveland at 10:00 a. m., Aug. 24. Ask agents for details. 271

Lists of names of captains and engineers of lake ships, appointments of 1897, may be had from the Marine Review for \$1. Vest pocket size.

Officials of United States Courts.

From Blue Book of American Shipping.

The following list of United States courts, with names of judges, clerks, marshals and district attorneys, refers only to the districts bordering on the lakes:

Second circuit, including northern district of New York—Justice Rufus W. Peckham and Judges Wm. J. Wallace, E. Henry Lacombe and Nathaniel Shipman; clerk, Wm. Parkin, New York, N. Y.

Sixth circuit, including northern Ohio and eastern and western Michigan districts—Justice John M. Harlan and Judges Wm. H. Taft and Horace H. Lurton; clerk, Frank O. Loveland, Cincinnati, Ohio.

Seventh circuit, including northern Illinois and eastern and western Wisconsin districts—Justice Henry B. Brown and Judges Wm. A. Woods, James G. Jenkins and John W. Showalter; clerk, Oliver T. Morton, Chicago, Ill.

Eighth circuit, including district of Minnesota—Justice David J. Brewer and Judges Henry C. Caldwell, Walter H. Sanborn and Amos M. Thayer; clerk, John D. Jordan, St. Louis, Mo.

Northern district of New York—Judge Alfred C. Coxe, Utica, N. Y.; clerk, Charles B. Germain, Buffalo; marshal, Fletcher C. Peck, Elmira; district attorney, Wm. A. Poncher, Utica.

Northern district of Ohio—Judge Augustus J. Ricks, Cleveland; clerk, H. F. Carleton, Cleveland; marshal, M. A. Smalley, Cleveland.

Eastern district of Michigan—Judge Henry H. Swan, Detroit; clerk, D. J. Davison, Detroit; marshal, Eugene D. Winney, Detroit; district attorney, Alfred P. Lyon, Detroit.

Western district of Michigan—Judge Henry F. Severens, Grand Rapids; clerk, John McQuewan, Grand Rapids; marshal, Charles R. Pratt, Grand Rapids; district attorney, John Power, Grand Rapids.

Northern district of Illinois—Judge Peter Grosscup, Chicago; clerk, T. C. MacMillan, Chicago; marshal, John W. Arnold, Chicago; district attorney, John C. Block, Chicago.

Eastern district of Wisconsin—Judge Wm. H. Seaman, Sheboygan; clerk, Edward Kurtz, Milwaukee; marshal, George W. Pratt, Milwaukee; district attorney, M. C. Phillips, Oshkosh.

Western district of Wisconsin—Judge Romanzo Bunn, Madison; clerk, F. W. Oakly, Madison; marshal, W. H. Canon, Madison; district attorney, H. E. Briggs, Madison.

District of Minnesota—Judge William Lochren, Minneapolis; clerk, Wm. A. Spencer, St. Paul; marshal, Richard T. O'Connor, St. Paul; district attorney, Edward C. Stringer, St. Paul.

A large French battleship, the Hoche, is soon to be fitted with Belleville water tube boilers in place of cylindrical boilers now in the vessel. The new boilers will be sixteen in number, of the 1896 Belleville pattern, arranged in four groups, the total grate surface being 866.5 square feet, and the working pressure being about 70 pounds above that at the engines, or about 155 pounds per square inch. With the new boiler power, it is expected that the designed I. H. P., 11,836, will be easily attained and the speed increased slightly. Engines are of the vertical twin screw type, with cylinders 62 and 79½ inches in diameter, and a stroke of 39.4 inches.

Special trains have been chartered via the Nickel Plate road from Lorain to Linwood Park, Aug. 18, and from Cleveland to Oak Point, Aug. 22. Train leaves Cleveland at 8:00 a. m., stopping for passengers at Lorain.

U. S. ENGINEER OFFICE, Duluth, Minn.,
July 10, 1897.—Sealed proposals for building two breakwater piers, each some 2700 feet long, at Lake Superior entrance to Portage Lake Ship Canals, Mich., will be received here until noon, Sept. 10, 1897, and then publicly opened. Information furnished on application. **CLINTON B. SEARS, Major Engrs.**
Sept. 3.

U. S. ENGINEER OFFICE, TELEPHONE
Building, Detroit, Mich., Aug. 2, 1897.
Sealed Proposals for Dredging and Submarine Rock Excavation, in the St. Marys river, Mich., will be received here until 12 o'clock noon (Standard time) August 31, 1897, and then publicly opened. Apply here, or at U. S. Engineer Office, Sault Ste. Marie, Mich., for specifications.
G. J. LYDECKER, Lt. Col., Engrs.

Aug. 26.

The Bessemer Steamship Company

Solicits Catalogues, Prices and Discounts from manufacturers and wholesale dealers in Ship Machinery, Brass Goods, Rope, Paints, Asbestos, Packing, Hose, Furniture, Piping, Glass and Crockery, Tinware, Ranges, Carpeting, Bedding, Life-preservers, Rafts and Boats, Engineers' Supplies and Tools, Carpenters' Tools, Electric Supplies, Lamps, Grate Bars, Castings, etc., etc., etc.

ALSO QUOTATIONS from Market men and Grocers on the Lakes for Provisions and Meat, best quality only.

CATALOGUES without quotations are not wanted.

ALL GOODS except provisions to be delivered in Cleveland.

Address **L. M. BOWERS, General Manager,**
CLEVELAND, OHIO.

Around the Lakes.

The Cleveland steam yacht Wadena, owned by Mr. J. H. Wade, was one of the yachts in the cruise of the New York Yacht Club.

Capt. Robert Rhynas, who died at St. Mary's hospital in Detroit, on Monday last, was best known as master of the famous old passenger steamer Nyack.

The Roberts boiler in the cruising steam yacht Theresa, owned by Mr. Gustavus Sidenberg of New York city, is said to have steamed over 70,000 miles without repairs.

A large triple expansion engine for the new steamer building at Davidson's West Bay City yard has just been completed by the Frontier Iron Works of Detroit.

A circular just issued by the light-house board describes the new system of range lights in Portage lake and river, which are to be in operation on and after August 18.

A new steam fog signal at Big Sable light station, Lake Superior, will be in operation after Sept. 1. Blasts will be of three seconds duration, separated by silent intervals of seventeen seconds.

Tonnage of the new Wolvin steamer Empire City, which will be commanded by Capt. Ralph Lyons, and which is about ready to leave Cleveland on her maiden voyage, is 4,118 gross and 3,268.65 net. Her official number is 136,623.

Lake lines seem to be getting a full share of east bound freight business out of Chicago, as against the trunk line railways. Last week's shipments by lake amounted to 136,203 tons, against only 36,112 tons of through business to the seaboard taken by the ten trunk lines.

Of nine competitors for the work of building the new life saving station at Lake View Beach, three miles from Port Huron, the bid of L. F. Zills of Port Huron, \$3,834, was the lowest. It is expected that the station will be ready for service immediately upon the opening of navigation next year.

The Connersville Elevator Co., which is engaged in the building of one of the new steel elevators at Buffalo, has secured another contract for a steel house. They will build for the Canadian Pacific Co. at Fort William an elevator of 1,500,000 bushels capacity, the work to be completed in February.

Work of construction has begun on a duplicate of the steamer Starucca, also for the Union line, at the Union Dry Dock Co.'s yard in Buffalo, but the rumor of preparations at the Union yard for the construction of a 600-foot dry dock is premature. Such a dock was projected last year, and would have been built then but for the need of the space for something else. It will be built sometime, and that is all the authorities will say about it now.

Luce's "Seamanship" is a book that is specially suited to assist young officers of the naval reserve. It is being used by naval reserve organizations all over the country. It is a standard work, selling at \$10, and will be mailed to any address at that figure by the Marine Review, 409 Perry-Payne building, Cleveland.

An excursion to Lily Dale, on Cassadaga lake, visiting Chautauqua lake enroute, is offered Aug. 20 via the Nickel Plate road. Ask agents for time of train and rates.

285

Chas. E. & W. F. Peck,

58 William St.
NEW YORK CITY.

812 Royal Insurance Building,
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C. T. BOWRING & CO.,
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Are prepared to make rates on all classes of Marine Insurance on the great lakes, both CARGOES and HULLS.

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Newport News Shipbuilding & Dry Dock COMPANY.

WORKS AT NEWPORT NEWS, VA.
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Equipped with a Simpson's Basin Dry Dock capable of docking a vessel 600 feet long, drawing 25 feet of water, at any stage of the tide. Repairs made promptly and at reasonable rates.

SHIP AND ENGINE BUILDERS.

For estimates and further particulars, address

C. B. ORCUTT, Pres't,
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FOR SALE—

CRUISING YACHT, 42 feet long, worth \$2,000.
Will be sold cheap for cash. For information
inquire

853 Stark St., Cleveland, O.

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ADVERTISING RATES
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\$5.

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CONTAINING PARTICULARS
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AND OWNERS FOR
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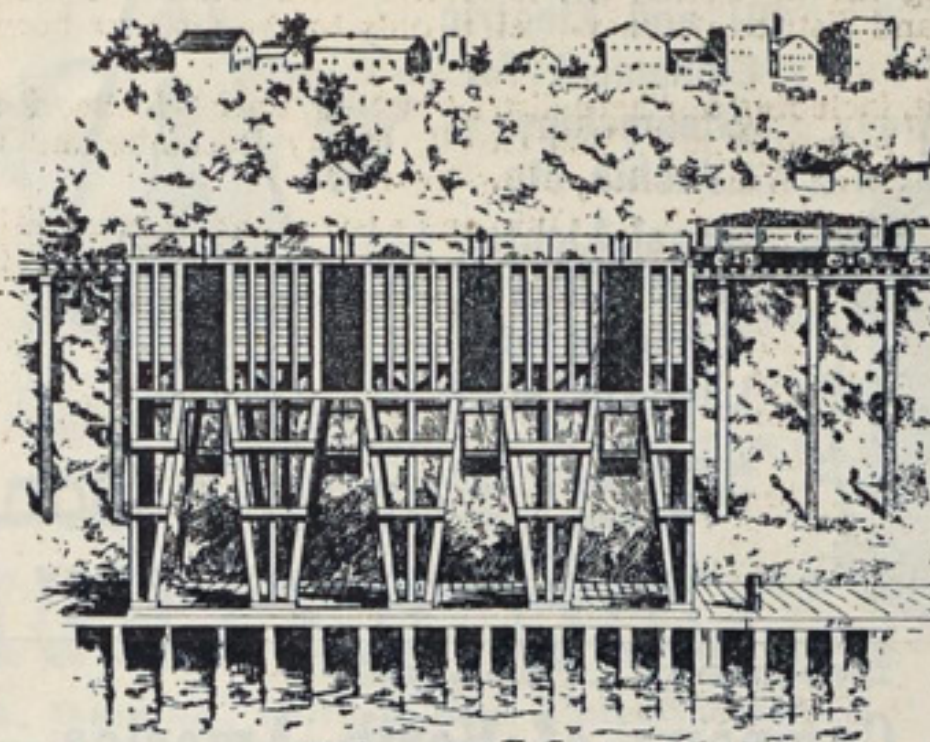
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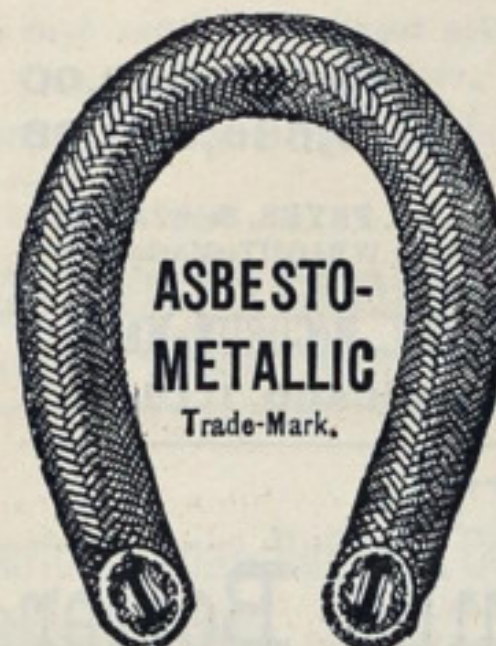
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**Best
Youghiogheny
Steam Coal
Furnished
Day or Night.
No delay as
Elevated
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are used.**

Telephone 1106.



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ASBESTO - METALLIC PACKING

It is in use on more lake steamers
than any other, because it meets
the requirements.

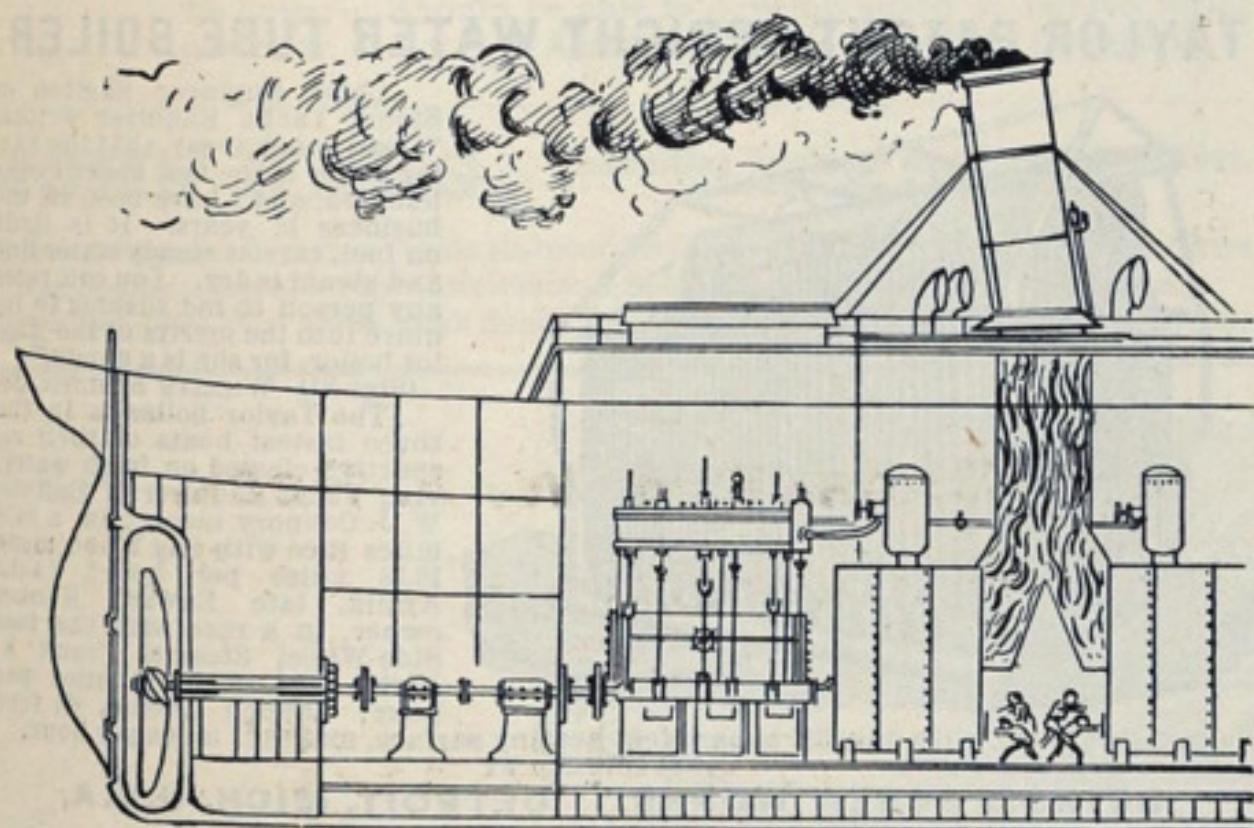
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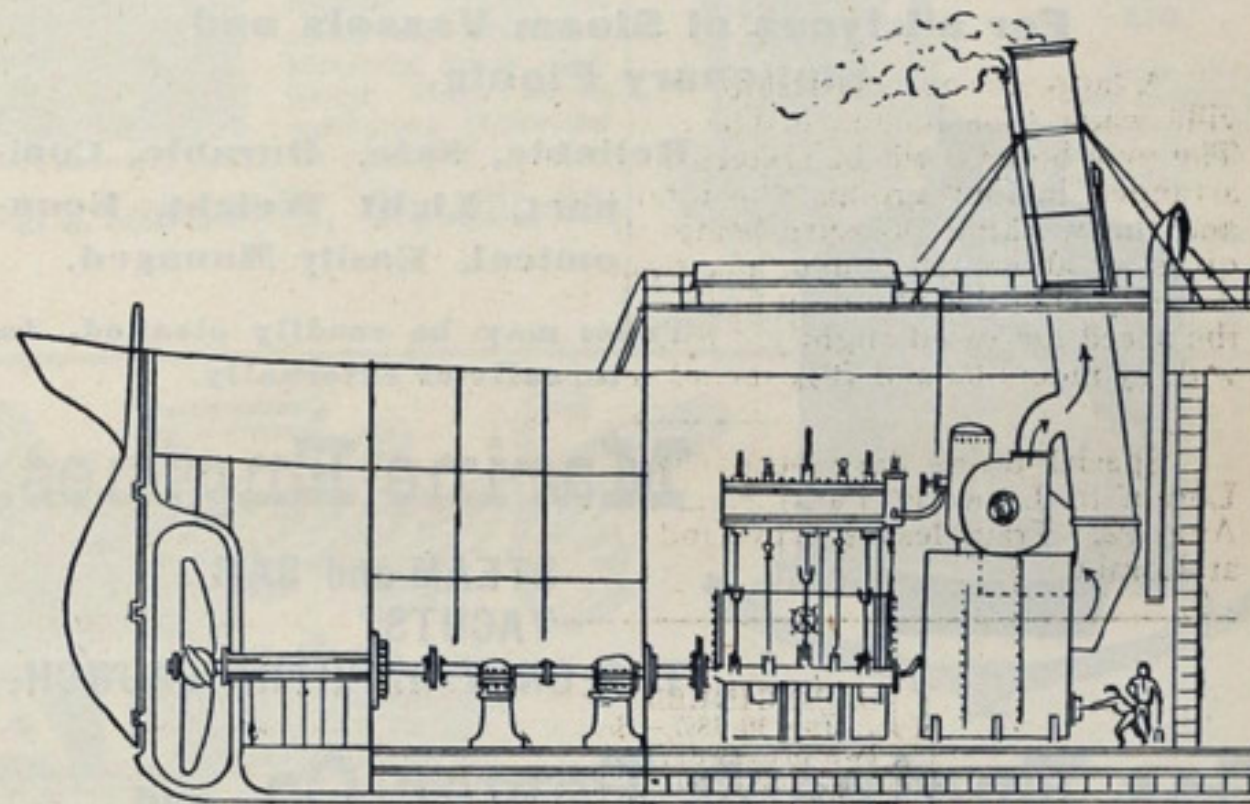


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From LORAIN, OHIO, August 2, 1896,
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Ellis & Eaves Induced Draft and Serve Tubes—Guaranteed to Save 25% in Fuel.

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From TWO HARBORS, WIS. 1896,
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Corresponding Amounts, Provided this Steamer had been
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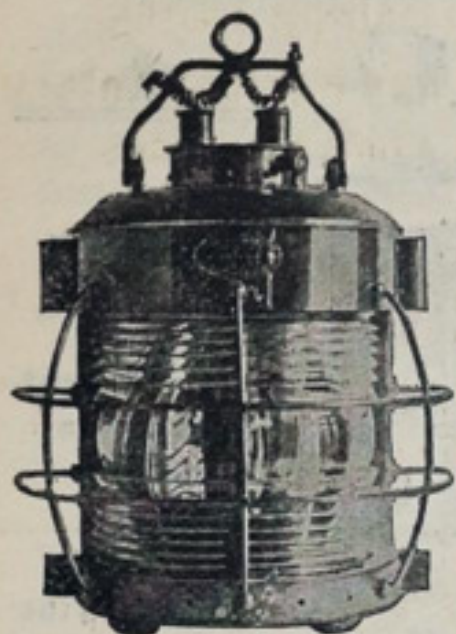
ENGINEER'S DEPT.									Saving.		
Fuel, 165 tons.....	\$348	62				\$261	46		25		
Oils.....	15	14				15	14				
Repairs.....	1	00				1	00				
Supplies.....	11	66	\$376	41		11	66				
STEWARD'S DEPT.											
Provisions.....	119	20						289	26		
Supplies.....	3	37	122	57				122	57		
Handling Cargoes (unloading).....	364	40									
Hull Repairs.....	20	25									
Towing.....	12	00									
Chandlery.....	1	38									
Sundry.....	13	15	411	18				411	18		
WAGES—ELEVEN DAYS.											
Captain.....	\$175.00	per mo.	64	16		64	16				
Mate.....	80.00		29	33		29	33				
2d Mate.....	56.00		20	54		20	54				
2 Wheelmen.....	34.00 (12.46)		24	92		24	92				
2 Lookouts.....	34.00 (12.46)		24	92		24	92				
1st Engineer.....	112.50		41	25		41	25				
2d Engineer.....	80.00		29	33		29	33				
2 Greasers.....	34.00 (12.46)		24	92		24	92				
3 FIREMEN.....	34.00 (12.46)		37	38		37	38				
4 Deck-hands.....	17.00 (6.23)		24	92		24	92				
1st Cook.....	60.00		22	00		22	00				
2d Cook.....	17.00		6	23		6	23				
Total Expenditures.....			349	90				349	90		
			1260	06				1172	91		

Up Cargo, 2453 (1900) net tons.
Down " 2265 gross "

Net saving each trip, \$87.15.

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Oil and Electric
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CAPITAL, Paid up in Cash, - - - \$3,000,000.00
ASSETS, - - - - - 9,686,808.08

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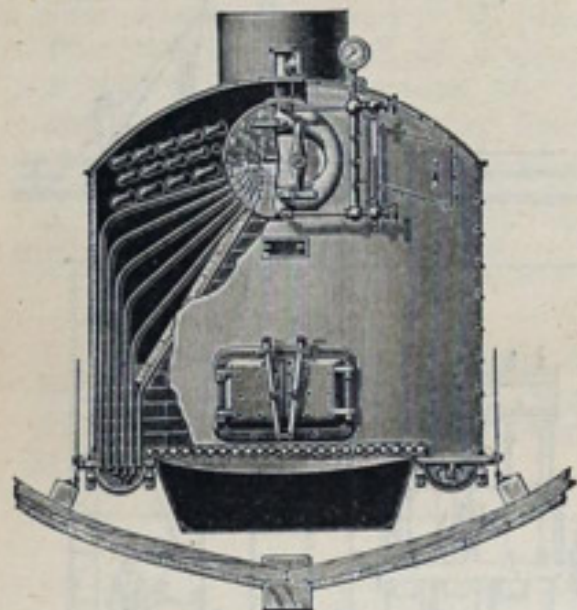
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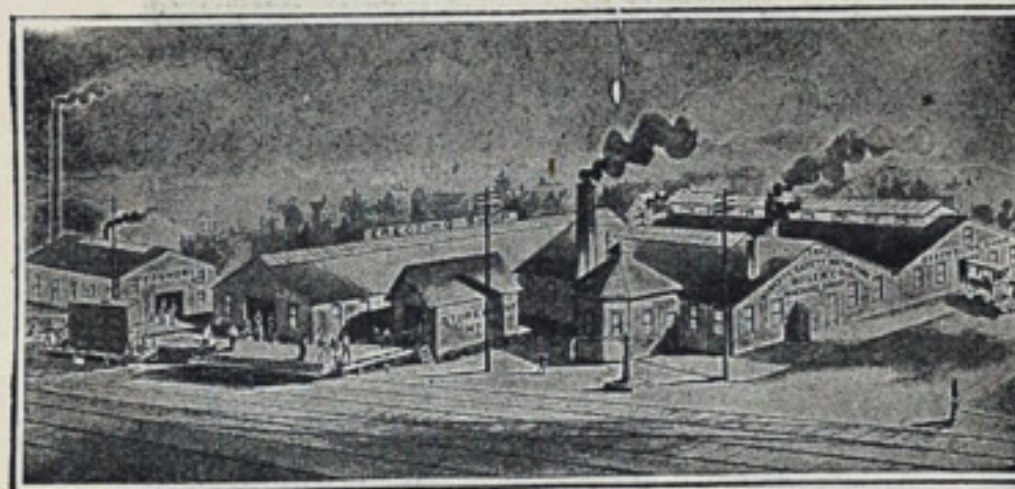
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West Superior
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Safety Water-
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39 and 41 Cort-
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Gentlemen:
Replying to
yours of the
28th I am glad

to say that the boiler you furnished us for tug "ISLAY" is giving entire satisfac-
tion. I have heard no complaint about it whatever, but have heard a good deal in its
favor. I ride on the boat frequently and must say that I am much pleased with its
work. Very Truly yours,
Alexander McDougall, General Manager.

THE ROBERTS BOILER is the Cheapest, Best and Lasts Longest.

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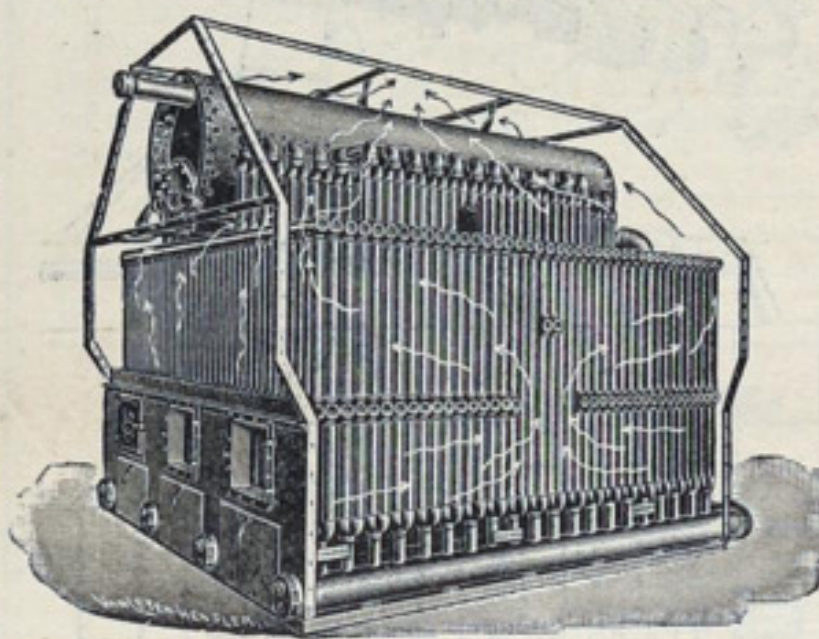
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Chief Engineer Skelton of
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"I can honestly say, that the Tay-
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on fuel, carries steady water line
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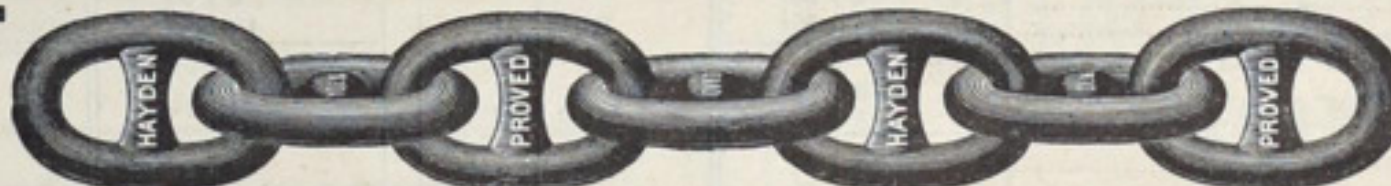
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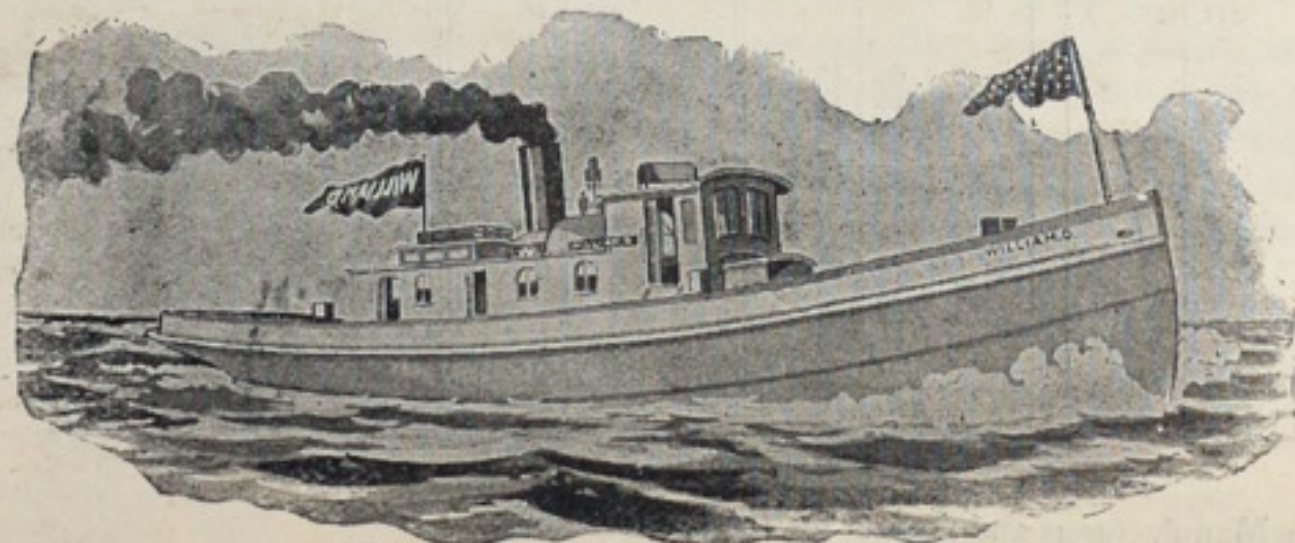
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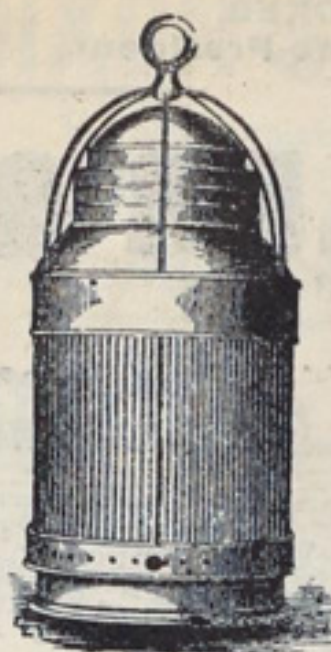
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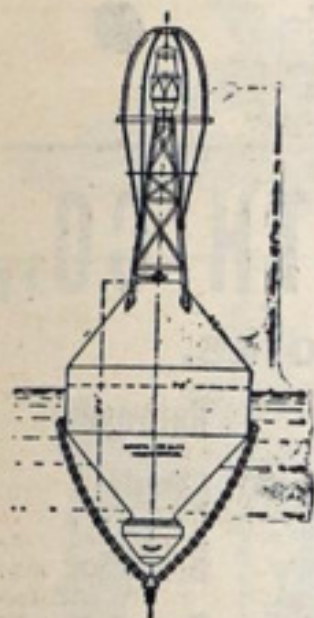
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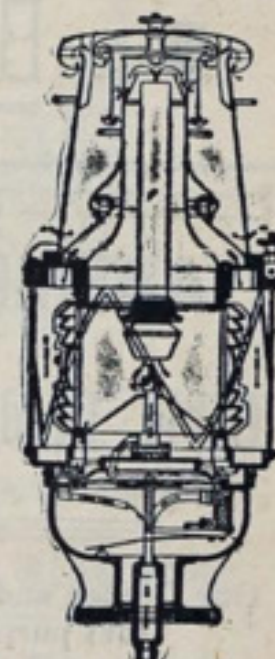
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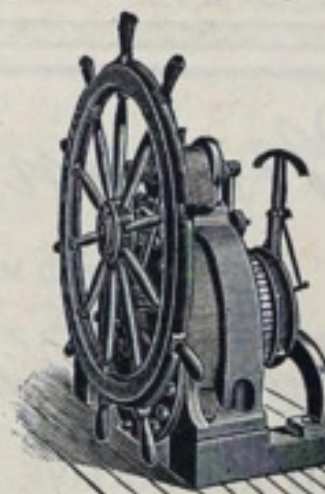


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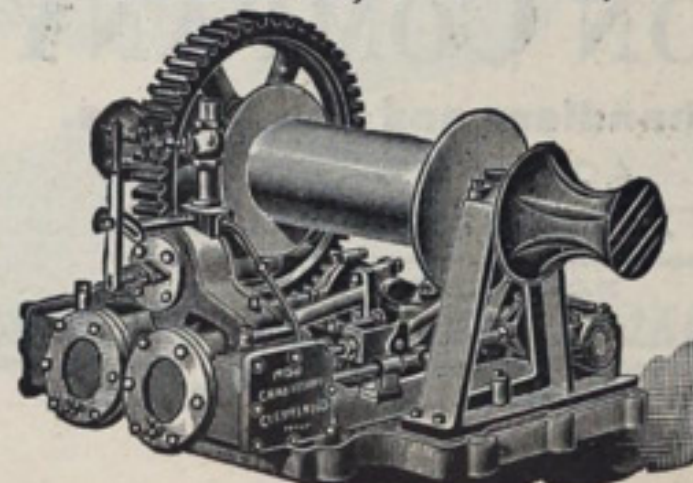
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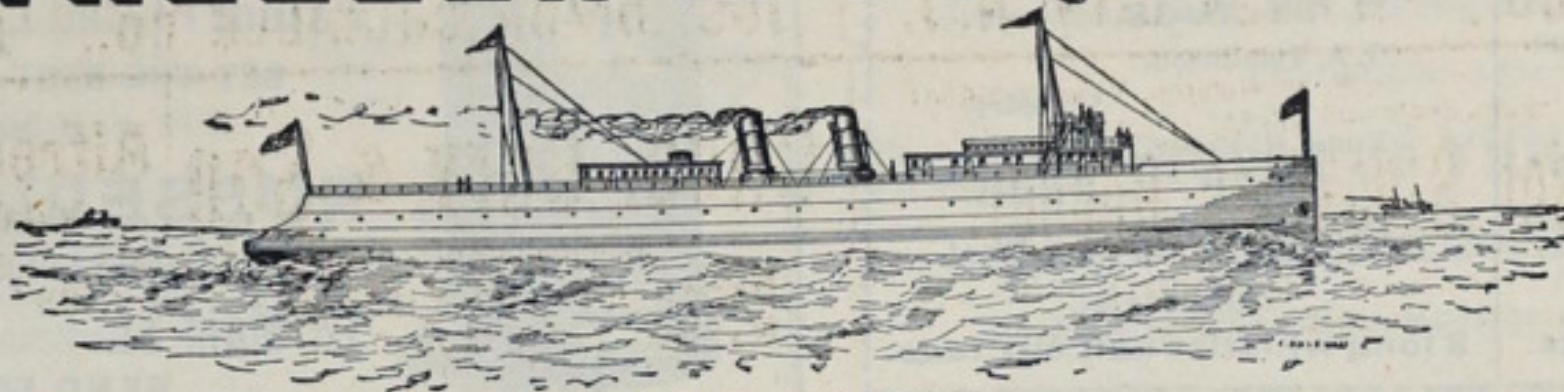
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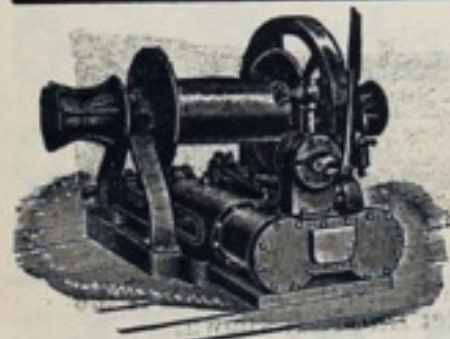
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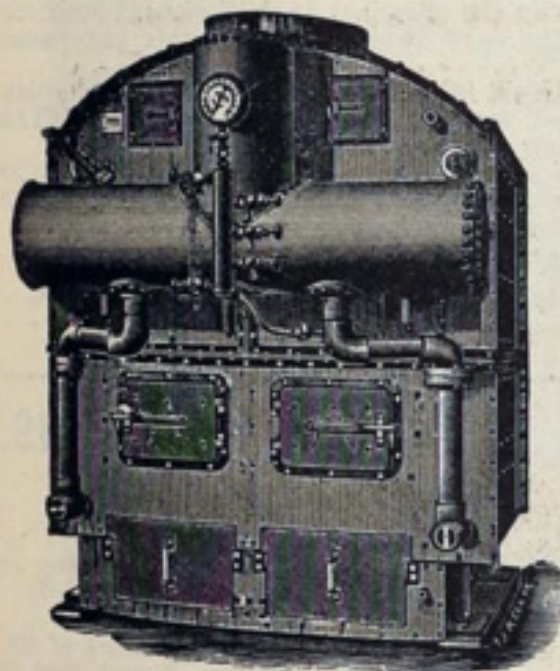
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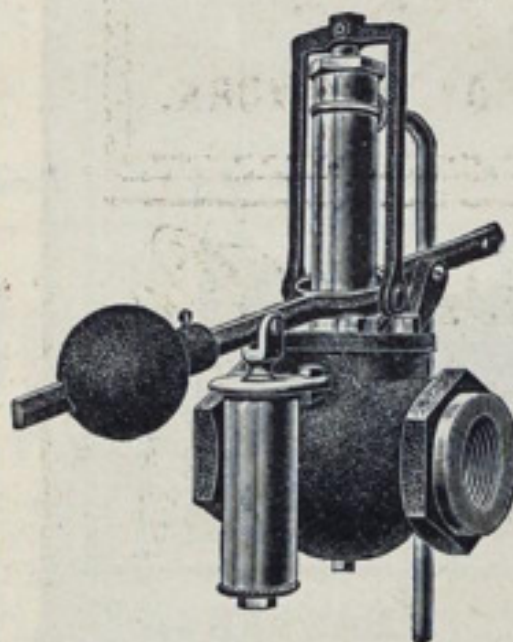
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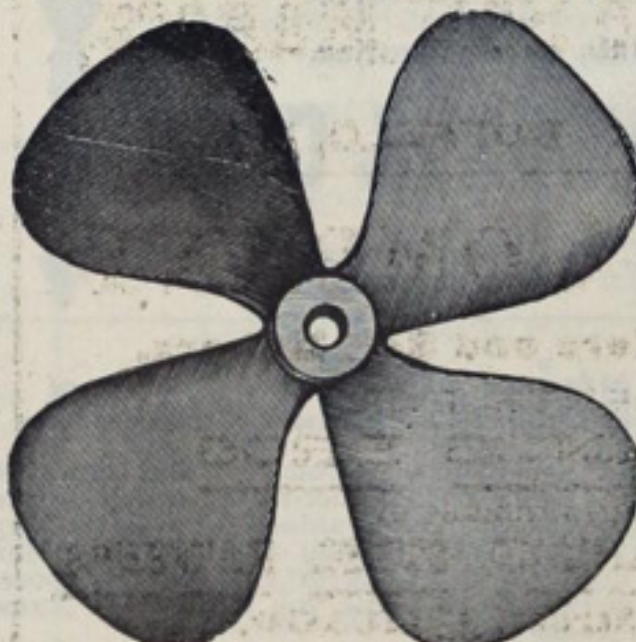
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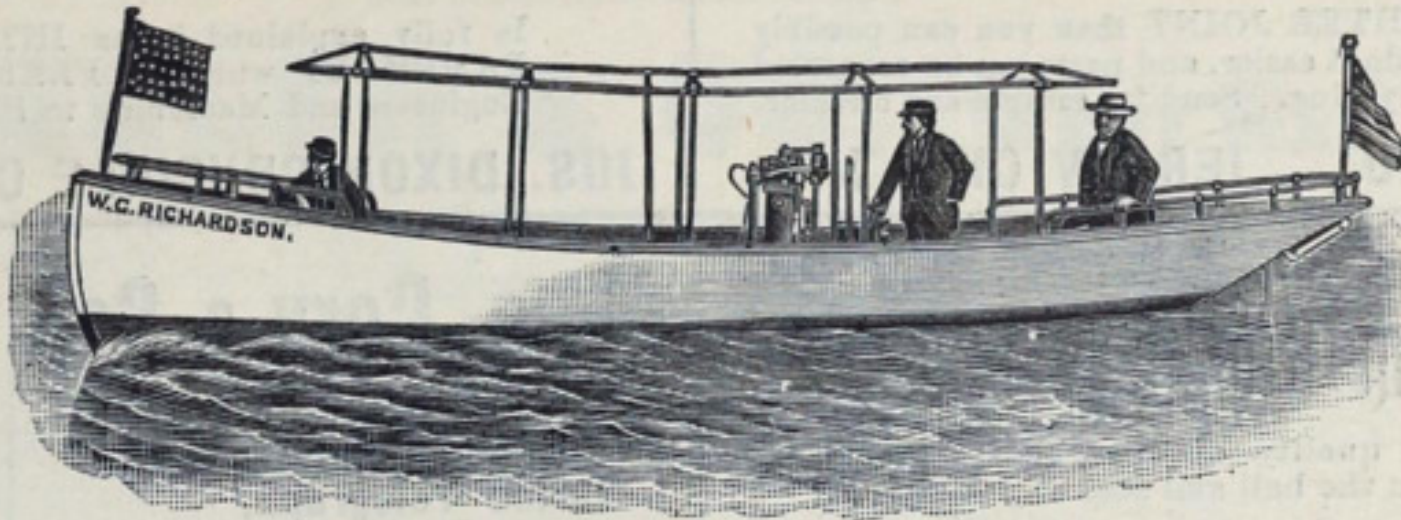


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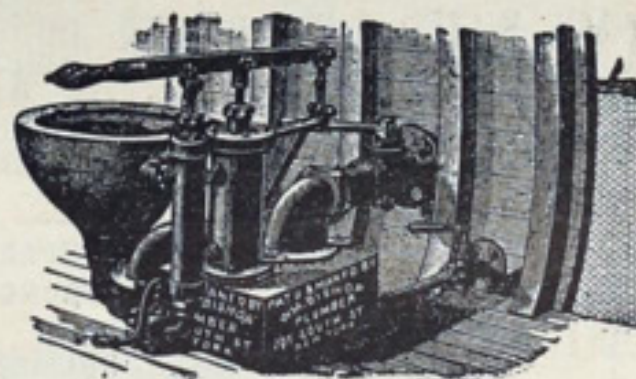
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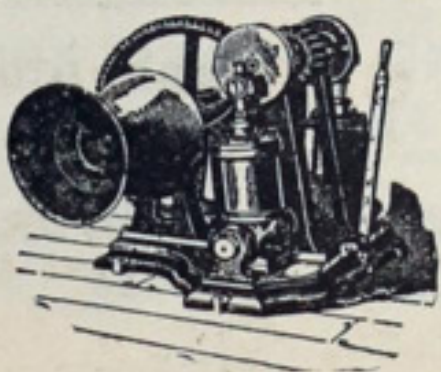
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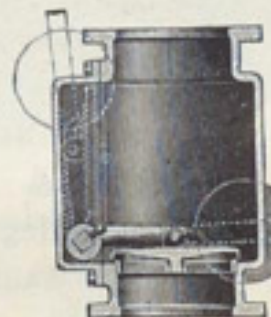


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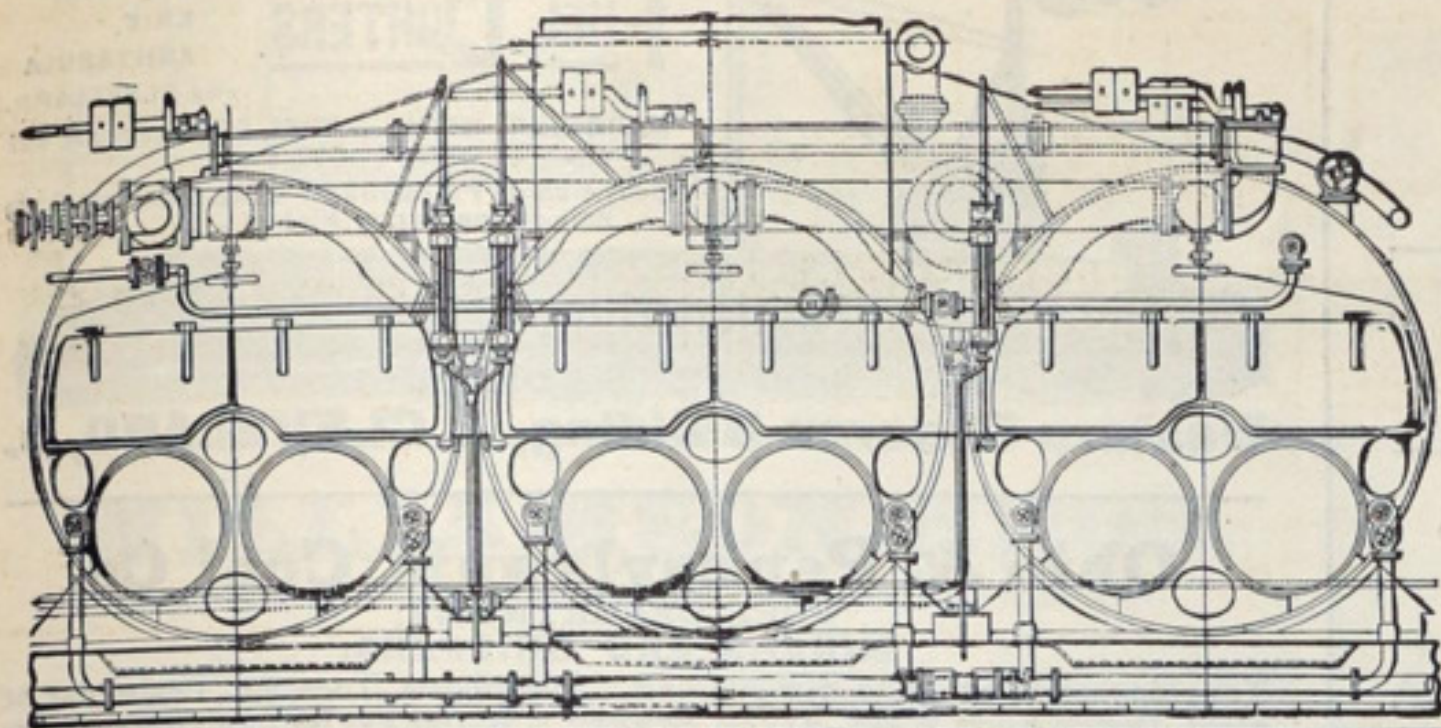
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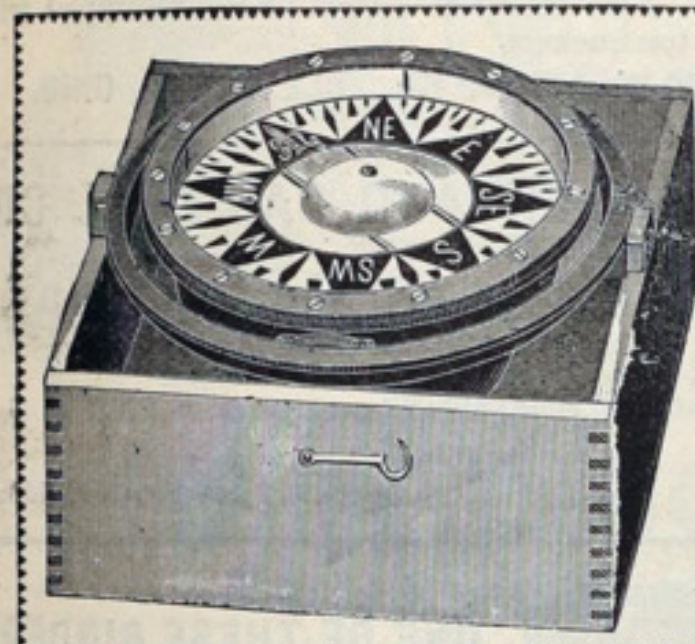
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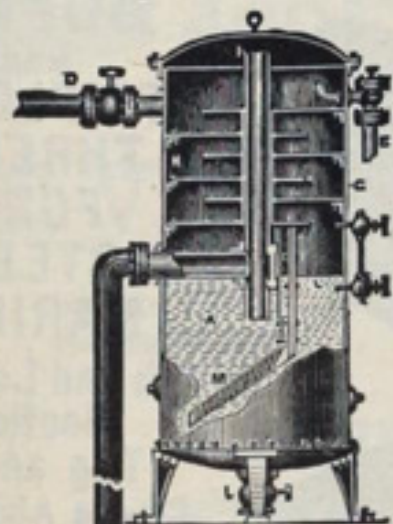
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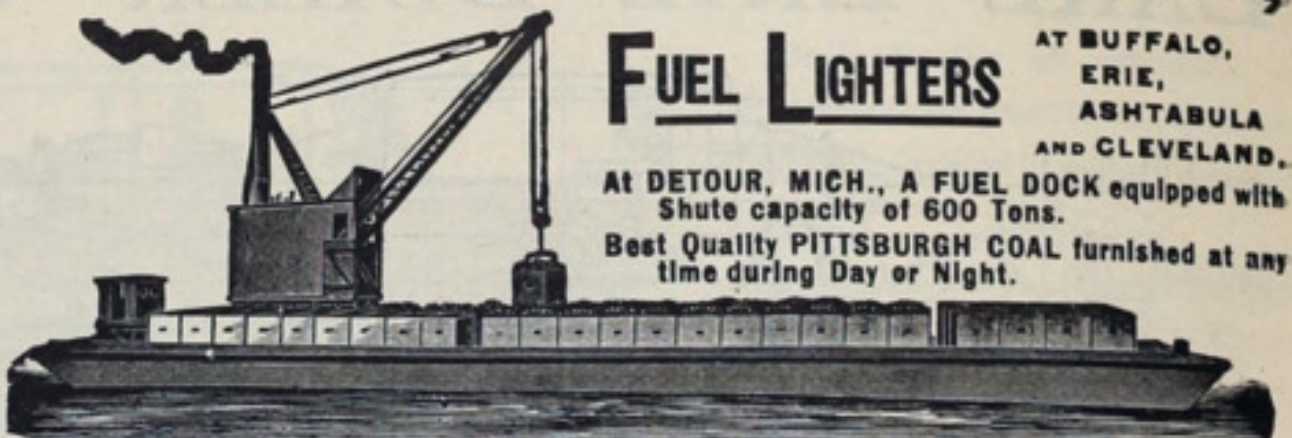
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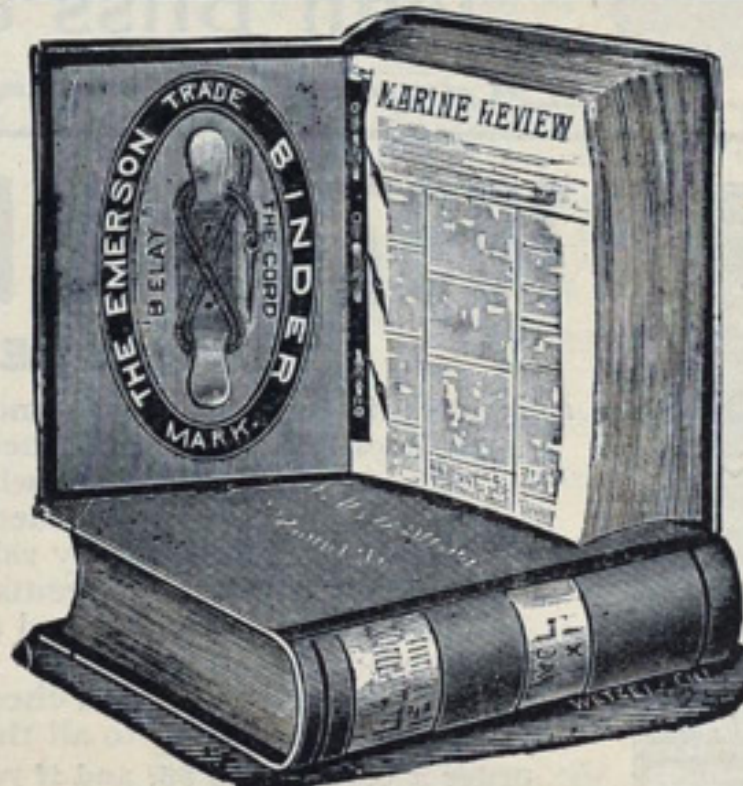
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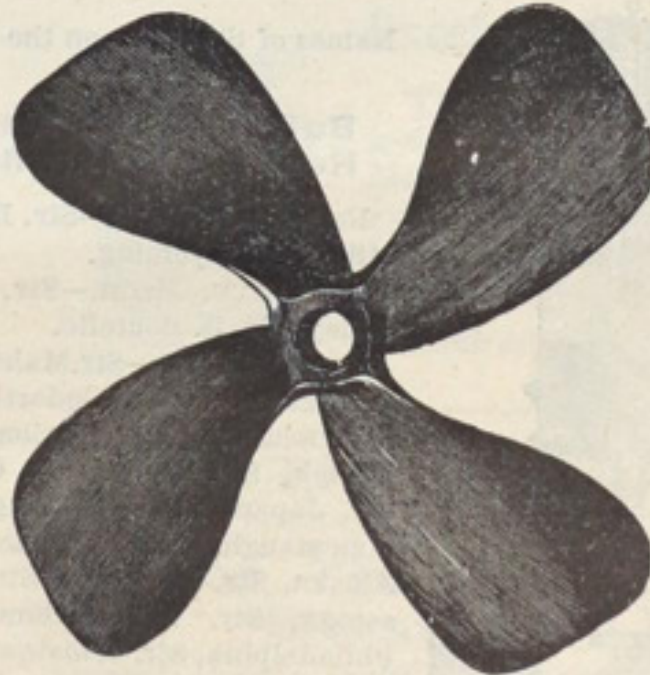
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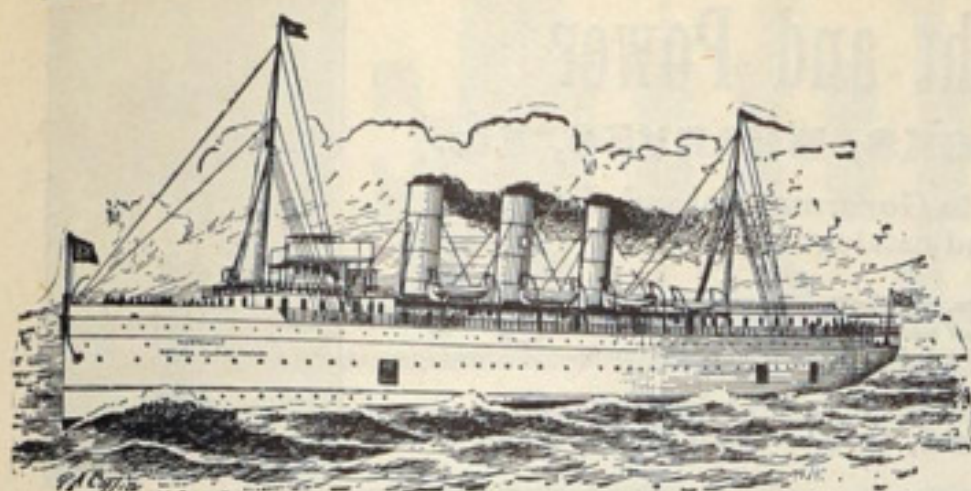
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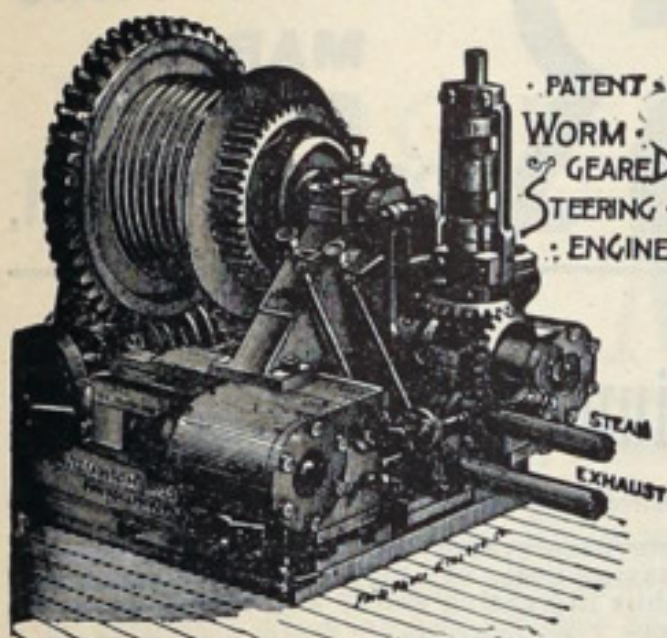
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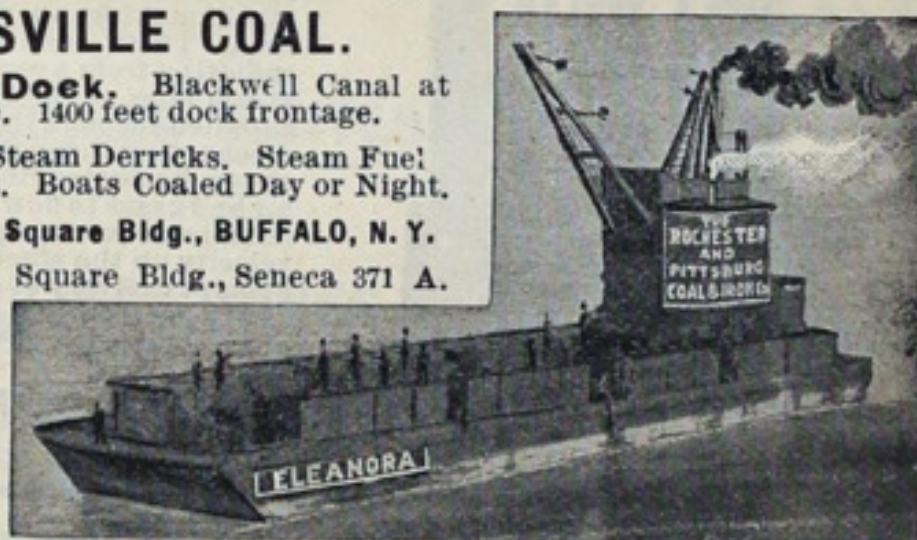
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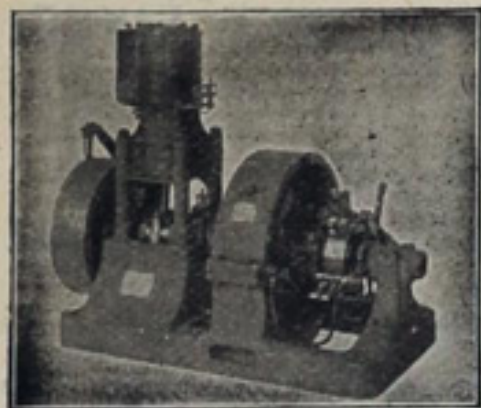
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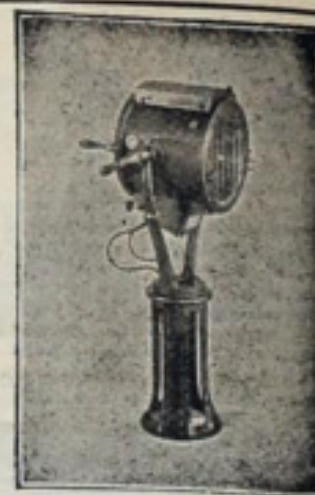
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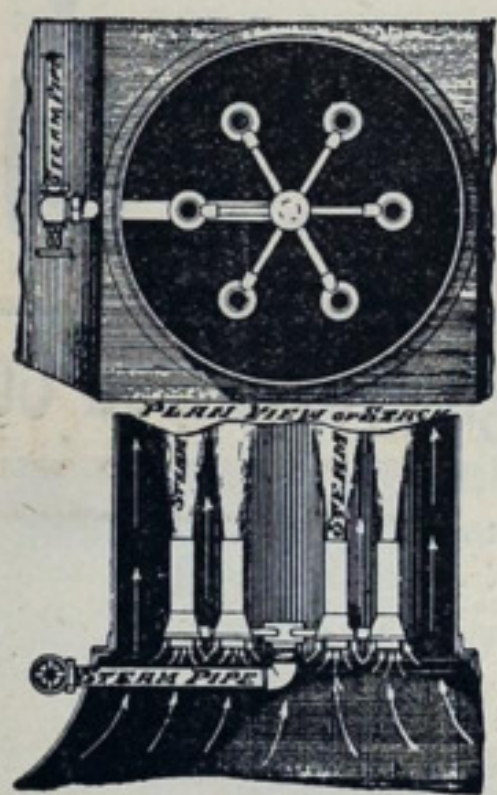
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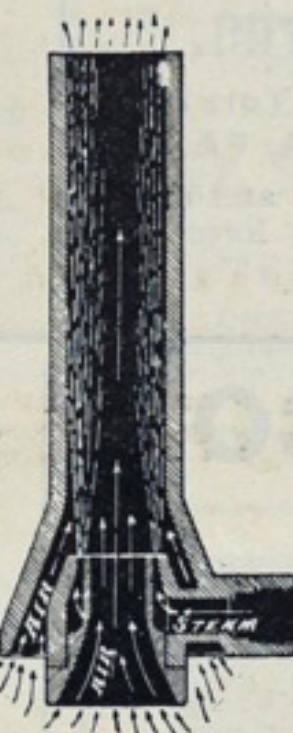
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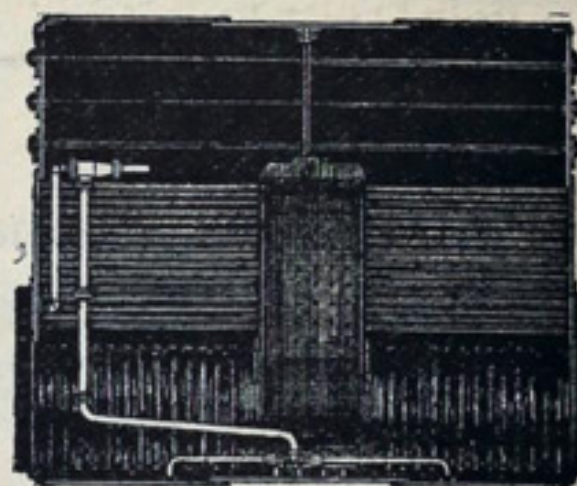


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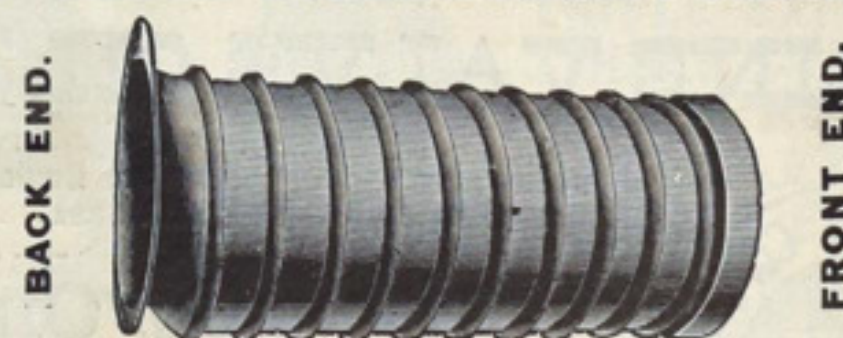
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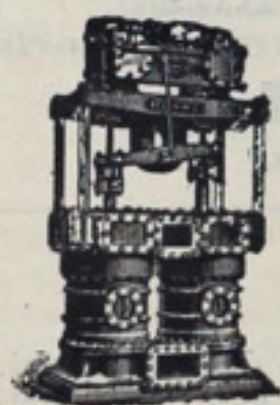
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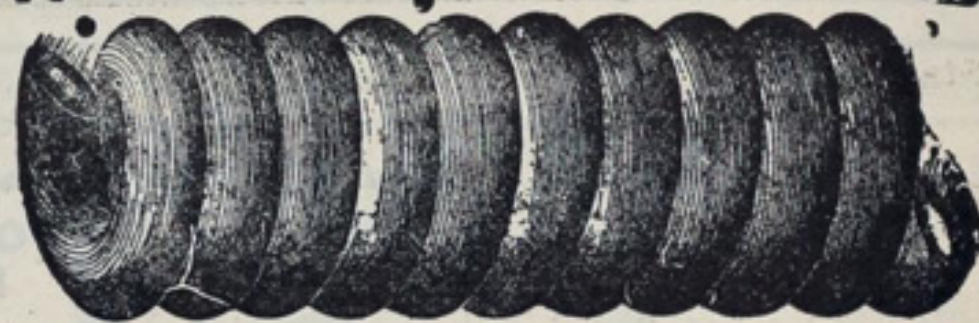
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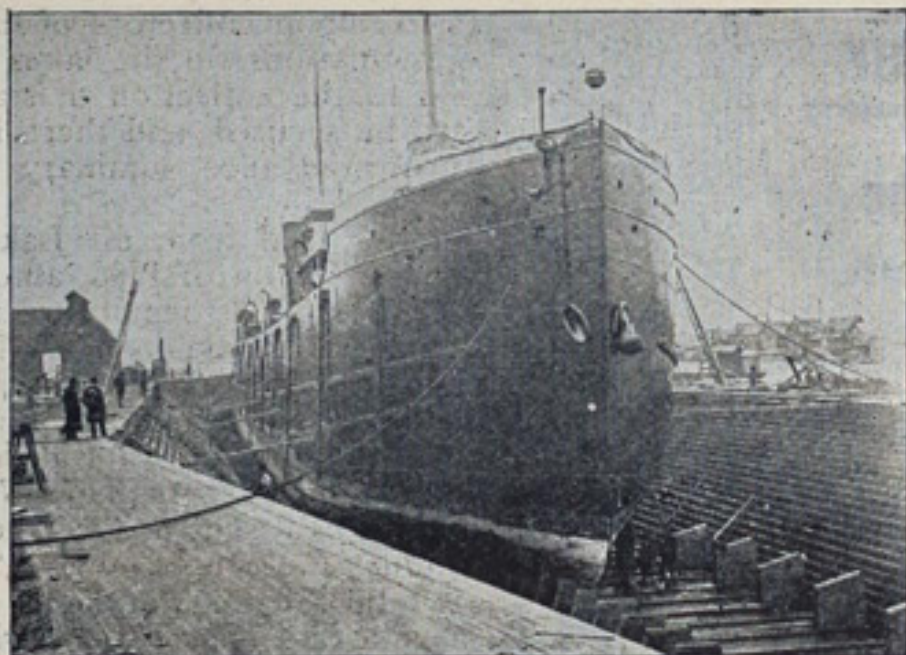
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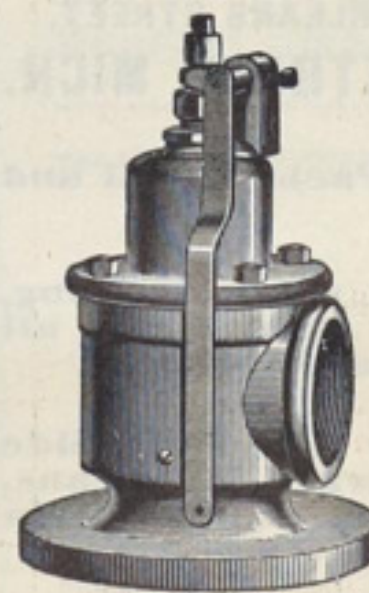
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